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ABSTRACT

Research has shown that with thorough training, most teachers can acquire new skills and strategies to add to their instructional repertoires. However, the literature also identifies a frequent failure to transfer new knowledge to classroom practice among trainees. Building on previous research, the study reported here investigated the effects of peer coaching on the classroom application of new teaching techniques. A mixed design of group and subject comparisons was employed, sampling 21 teachers and 6 peer coaches in two school districts; student data were obtained from one class for each of the participating trainees. Data were gathered from observations, tests, teacher plans, and interviews. Major findings are as follows: (1) Peer coaches can be trained in a relatively brief period to provide follow-up training to other teachers. For peer coaches, continuing access to training and continuing work on content training are important factors. (2) Peer coaching increased the transfer of training rate for coached teachers compared to uncoached teachers. (3) Students of coached teachers performed better on a concept attainment measure than did students of uncoached teachers. Because the integration of strategies with curriculum is still the most difficult element of transfer, training should focus on "thinking" with new models. Design and implementation of effective training systems require determined leadership by administrators. A 38-page training manual, which includes a definition of coaching and examples of problems, is appended. A 36-item reference list is provided. (CJH)

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PEER COACHING:
A STRATEGY FOR FACILITATING TRANSFER OF TRAINING

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October 1984

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FINAL REPORT

PEER COACHING:

A Strategy for Facilitating Transfer of Training

Research on training has demonstrated that with thorough training that includes theory, demonstration, opportunities for practice, and feedback, most teachers can acquire skills and strategies previously absent from their teaching repertoires (Joyce and Showers 1982, 1983). The literature on training effects, however, also identifies a frequent failure to transfer new knowledge and skills to classroom practice, or, if initial transfer was accomplished, a rapid attrition of new behaviors over time (Fullan 1982). In addition, if the object of training was adding to teachers' repertoires skills and strategies radically different from their normal teaching styles instead of merely fine tuning existing behaviors, transfer was unlikely to occur at all (Baker 1983; Joyce and Showers 1983; Showers 1982). Teacher trainers have for so long assumed that transfer would occur once skills were mastered, that we have, for the most part, had to rely on researchers who study the change process to discover that much of our training has disappeared at the point we most care about--the interaction between teachers and students.

Research Questions

The study reported here built on previous research on the effects of coaching on teachers' transfer of learning from training settings to classroom practice (Showers 1982). Three major questions were addressed in the present study:

1) Can teachers be trained to coach their peers in the classroom application of new teaching strategies?

At the time we began our study, work by Roper, Deal and Dornbusch (1976) and Sharan and Hertz-Lazarowitz (1981) had illustrated the feasibility of training teachers to provide training to each other, and a specific

coaching technology had been developed for the acquisition of new mode. of teaching. If coaching as a training strategy were to be widely implemented, however, it was necessary to determine if coaching skills could be learned in much the same way teaching skills are learned.

2) Do teachers who are coached by peers transfer training at a greater rate than uncoached teachers (following identical initial training)?

Teachers coached by Showers in her 1982 study were much more successful in transferring learned skills into their teaching repertoires than were uncoached teachers. If peer coaches could achieve similar transfer effects, a powerful and implementable training device would be available for schools attempting changes involving the acquisition of new knowledge and skills for teachers.

3) Do students of peer-coached teachers perform better on a general transfer task as well as on a model-specific task than do students of uncoached teachers?

Relationships inferred between student learning and inservice teacher training are meaningless when teaching behaviors learned in training settings are not implemented in classroom teaching. However, when we can determine that trained behaviors have been transferred to classroom practice, it is reasonable to measure effects of teaching on student learning (e.g., if a teacher learns a concept attainment strategy and uses it appropriately with her students within a given subject area, do students become more able to attain concepts independently?).

In addition, this study examined the relationship of teacher conceptual level (CL) to transfer of training rates, the attitudes of both peer coaches and

teacher trainees toward the peer-coaching process, and the transfer problems experienced by teachers as they attempted to implement new teaching strategies in their classrooms.

The present study was grounded in research on training procedures and effectiveness, studies of transfer of training, and work on change in schools.

DESIGN

This study employed a mixed design of between groups and within subjects comparisons to address the questions raised in this research (i.e., the ability of teachers to coach their peers, the effects of that coaching on teachers' ability to transfer trained behaviors to their teaching repertoires, and the links between training, teacher behavior, and student outcomes). The teacher sample was drawn from six area middle and junior high schools, and the student sample was comprised of one intact class for each of the participating teacher trainees. Peer coaches were selected from teachers with earlier experience with both the content and process of the training. Specific questions were addressed by analyzing data collected from observations, paper and pencil tests, and teacher plans, records of use, and interviews.

Sample

Recruitment Procedures. In January 1983, six peer coaches and 21 teachers from six schools were recruited from two school districts. The principal investigator met with central office administrators, school principals and entire faculties to explain the purposes of the project and to seek participation.

Teacher trainees. The 21 teacher trainees included 5 males and 16 females with a mean of 12.48 years teaching experience (range 3 to 24 years, S.D.

= 5.4 years). Seven of the teachers had a Bachelor of Arts or Science degree, 12 held a Master of Arts or Science degree, and two had completed post-Master's level work in education. All taught at the junior high or middle school level. Although many of the teachers in our sample taught multiple subjects, for the purposes of this study we observed eight of the teachers in language arts, three in social studies, three in math, two in home economics, and one each in industrial arts, media, art, physical education, and health.

Peer Coaches. Four males and two females made up the peer-coach sample. The peer coaches had taught an average of 14.83 years (range 8 to 26 years, S.D. = 6.05 years). Two have a Bachelor of Arts or Science degree plus 45 units, three hold a Master of Arts or Science, and one holds an MA plus 45 units. During this study, they were teaching math/computer science (1), physical science (2), social studies (1), language arts (1), and language arts/math (1). Three were certified in elementary and three in secondary education. (In the state of Oregon, certification overlaps at the middle school/junior high level, with elementary certification including K-8, and secondary including 7-12).

As a group, the peer coaches were a highly motivated and professional group of teachers. They were viewed as successful teachers by their principals and their peers and had been frequently elected to positions in local teachers' organizations/unions. Four of the six expected at some point in the future to make career changes, either moving to school administration or district level positions in curriculum development or supervision. Three of the peer coaches participated as teacher trainees in the 1982 coaching study and three studied with the principal investigator during the summer of 1982.

Instruments

Paragraph Completion Method (PCM). Conceptual level (CL) of teachers was measured by the PCM developed by Hunt and his colleagues at the Ontario Institute for Studies in Education (1978). Because conceptual level appears to measure the degree of concreteness or abstractness with which an individual processes information and approaches a task, it was expected to predict each teacher's transfer of training rate. The measure consists of five stems (for adults) (e.g., "When I am criticized ..., etc.) to which the subject responds in three or four sentences. Each response is rated on a seven-point scale and the mean of the three highest scores becomes the CL score.

Extensive use of CL in earlier training studies and resultant findings (see Joyce, Brown and Peck 1981; and Miller 1981), ease of administering and scoring the measure, and reliability and validity data on the paragraph completion method for determining conceptual level all contributed to the choice of this measure.

There are theoretical reasons as well why CL should differentiate teachers' abilities to accomplish transfer of training, given the nature of the transfer task. Considerable construct validity evidence supports the expectation that high CL persons will be more flexible, more capable of using alternative solutions and more stress-tolerant than low CL persons (Schroeder, Driver, and Struefert 1967). CL is theorized to range from concrete, rigid thought and behavior to abstract thought in which individuals can recognize the complexities of interrelationships. Miller (1981) in a review of research within the conceptual system theory framework, reported that "teachers of different CL have been shown to differ in the level of empathy displayed ..." and "the flexibility and

adaptability of teaching style has been found to be positively related to CL." Miller concluded that there is "reasonable support for the contention that teacher CL is related to consistent differences in teaching style" (p. 70). In this study, high CL was hypothesized to be positively related to acquisition of repertoire and transfer of skills to a complex instructional environment.

Correlations of CL with IQ, ability, and achievement measures have indicated some, though certainly not isomorphic, relationships between CL and ability (see Table 2 from Hunt, Butler, Noy and Rosser 1978). Hunt and his associates noted the following pattern in the correlations presented in the table below:

> Persons very low in ability/achievement are almost always low in CL; however high ability/achievement persons vary enormously in CL. This is the major reason why the relation of CL to ability/achievement generally decreases when high school and university student samples are considered since these are less likely to include persons very low in ability/achievement (p. 45).

Table 3

Summary of Correlations Between CL and IQ/Ability/Achievement Measure

Investigator	Measure	r	N	Persons Studied
Carr (1965)	SCAT	.22	45	University students
Chan (1975)	Wide Range Vocabulary Test	.42	42	High school students
Hunt (1972)	CTBS	.32	231	Grade 6 students
Hune (1973a)	CTBS	.42	239	Grade 6 students
Tomlinson (1971)	DAT	.32	190	Grade 8 students
Hunt (1973b)	SCAT	.37	276	Grade 8 students
Hunt (1973b)	SCAT	.35	189	Grade 8 students
McLachlan (1969)	CAAT-Verbal	.15	175	Grade 11 students
Hunt & Noy (1972)	Wonderlic Verbal	.31	71	Grade 12 students
Raphael (1975)	Wonderlic Verbal	.27	100	Grade 12 students

Clinical Assessment. In a previous study of CL and transfer of training (Showers 1982), CL effects were swamped by the coaching treatment. However, the variable was again included in the present study both because of the strength of earlier findings and also to determine if previous findings would be replicated. The Teaching Analysis Guides developed by Joyce and Weil (1980) were used to provide feedback to teachers during the initial training phase. The guides are rating forms on which fidelity to the parts of a strategy is

recorded. Gower (1974) compared ratings of 30 student teachers on the clinical assessment forms with the Teacher Innovator System (TIS). The forms, while providing much less detailed information than TIS, nevertheless consistently identified discrepancies between the teachers' performance and the ideal toward which they were aiming, and the discrepancies closely paralleled those recorded with TIS.

Teacher Innovator System (TIS). The full title of this instrument is the Teacher's College Skills and Strategies Interaction Analysis System. A modification of the Joyce "Conceptual Systems Instrument," the current system was developed by Marsha Weil, Chris Guillon, and Diane Cole. TIS was used to classify teacher behavior on three dimensions -- structuring, information processing, and feedback. Teacher behavior during a lesson was coded continuously rather than sampled.

Observers can be trained to use the instrument reliably in approximately 30 hours. Inter-rater agreement is computed on specific communications from typescripts of lessons (percentage of exact agreement) and by correlating the indices computed from two or more observations of the same lesson. Technical data on TIS may be found in McKibbin's (1974) comparison of TIS with the Flanders and Bellack interaction analysis systems.

The Teacher Innovator System (TIS) collects information on 16 dimensions of teacher/student behavior. Five categories are subsumed under "structuring" behavior, five under "information processing" and six under "Feedback." For each of the 16 categories, four possibilities exist at any point in the coding--teacher statements or questions and student statements or questions. Various indices may be computed for any lesson coded with TIS, e.g., total teacher state-

ments or questions; total student statements or questions; or total teacher and student communication at the factual, conceptual, or theoretical level of information processing. In addition, proportions may be computed, e.g., proportions of teacher statements in structuring to total teacher statements or proportion of teacher talk to student talk.

Because TIS data are collected continuously during a lesson and lessons varied in length, frequencies for each category and/or index were divided by time to yield a density factor for each behavior that could then be compared across teachers. Observers rarely code behavior at exactly the same rate, so total frequencies for any category are seldom the same for any two observers.

To determine inter-observer reliability on TIS, Cronbach's Alpha was computed for the nine observations in which two observers recorded the same lesson. Although correlations were computed for all individual items, only scales were included in the computation of Alpha reliability coefficients. Table 4 includes reliability coefficients for all scales used in the analysis of TIS data.

As can be seen in Table 4, adequate reliability was maintained on all scales with the exception of teacher and student theoretical information processing. The near absence of communications at this level made reliability of coding undeterminable.

Table 4

Reliability Coefficients for TIS

Scale	Cronbach's Alpha
Teacher Structuring	.76
Teacher/Student Information Processing	.98
Teacher/Student Feedback	.95
Teacher/Student Factual Info. Pro.	.97
Teacher/Student Conceptual Info. Pro.	.99
Teacher/Student Theoretical Info. Pro.	[zero variance]

Teacher Logs. The 24 teachers participating in the study kept records, or logs, detailing the frequency, purposes, and perceptions of success or failure of their experiences with the trained models of teaching. A format for recording this information was provided each teacher in notebook form.

Teacher Interviews. An initial interview was conducted with each teacher at the completion of initial training. The purpose of this interview was to probe teachers' perceptions of what they teach and how they teach it, and their current and predicted use of the strategies they had learned in the preceding weeks.

A final interview with each teacher, at the completion of the coaching phase, collected teacher perceptions regarding the training they had received, the usefulness and applicability of the models/strategies they had learned, problems encountered while attempting to use the models in their classrooms, and, for coached teachers, the usefulness of the coaching treatment.

Student Measures

V-3 Wide-Range Vocabulary Test

A measure of verbal ability was given to students in March and two instruments were administered to students following the teaching of the unit of instruction. The V-3 Wide Range Vocabulary Test is a 5-choice synonym test suitable for grades 7-16 and having items ranging from very easy to very difficult. The test has a total of 48 items (24 items in each of 2 parts) and 6 minutes is allowed for each part (Appendix A). The test is published by Educational Testing Service (1963); relevant technical information is provided in the Manual for Kit of Reference Tests for Cognitive Factors (French, Ekstrom, and Price 1963).

Experimental Unit Test

Eleven language arts and social studies teachers were given a common set of learning objectives for experimental units they taught from the same data banks, and students completed attitude and recall tests based on the data bank material. Several attempts were made to control effects of variables other than teachers' use of models on student achievement. The objective of the skills training and transfer training was the development of intelligently-guided repertoire. We hoped to give teachers ways of accomplishing a set of goals without suggesting these were the only strategies for achieving their goals.

The experimental unit was taught to differentiate between the performance of students of coached and uncoached teachers. The data banks of information presented in the unit and included in the performance test were developed using five criteria for substance and seven for form (see Joyce, Brown, and Peck, 1981, pp. 302-309). The criteria for substance included: Unusual (not normally

taught in the schools and not likely to have been learned incidentally through TV, newspapers, etc); not esoteric (within the normal world); not technical (should not require special knowledge to comprehend, such as background in biology or calculus); multifaceted (open to great variety of teaching styles and strategies because they are open to entry from a number of points of view rather than having simply one kind of entrance, as opposed to something like calculus that virtually requires certain sequences); and organic (parts should be related so that relational concepts can be developed by the students and also so that entry into any part of the substance may result in a full exploration of its totality or at least of many other facets of it).

The criteria for form in the development of the data were: amenability to variation in approaches; low-inferential quality (present information rather than conclusions to students so as to leave maximum room for conceptualization by the teacher and students); multimedia in nature, age appropriate (amendable to a reasonable spectrum of age in order for comparisons to be made about learners of various cognitive levels and other developmental variables); flexible roles required of teacher (materials can be used by teachers and studied by learners within a variety of role contexts); and small group teaching (to permit the intensive study of teacher and learner behavior).

The recall and attitude measures used to measure the outcomes of the unit were initially developed in the MOTAC studies conducted by David Hunt and Bruce Joyce in the early 1970s (see reports in Flexibility in Teaching 1981). The current revised version was developed at the Stanford Center for Research and Development in Teaching and is thoroughly reported in Christopher Clark, The Effects of Teacher Practice on Student Learning and Attitudes in Small Group

Instructions: Technical Report No. 47, 1976. Briefly, the recall tests correlate highly with verbal ability, but student attitude toward self and toward the learning situation varies widely with individual teacher styles.

Concept Attainment Test

Students of eight teachers of subjects other than language arts and social studies were administered a 40-minute concept attainment task. To avoid asking their teachers to teach a one-week unit unrelated to their curriculum, this test was substituted as an alternative to the experimental unit to measure the effects of teacher coaching on student performance.

The concept attainment test required students to apply the concept attainment strategy independently to new material. Positive and negative exemplars of the concept were presented and students were asked to determine the concept, list its attributes, provide examples and non-examples of the concept, and write a paragraph exploring the application of the concept to a new situation.

Procedures

Phase I -- Sample Selection, Pre-Testing, Initial Training

In January 1983, 21 junior high and middle school teachers were recruited for participation in the study. The six peer coaches were contacted in the fall of 1982 and were ready to begin work on the project in early January.

Initital TIS data were collected for two days in the classrooms of 17 of the 21 teacher trainees to provide a baseline of normal teaching behaviors/strategies. In late January, both the peer coaches and teacher trainees were administered the CL paragraph completion test, and tests were sent to OISE for scoring.

Teacher Conceptual Level (CL) was used as an independent variable because of its

possible interaction with ability to transfer new learning into classroom practice.

For seven weeks in January and February, the 21 teacher trainees completed 18 hours of instruction in two new models of teaching. All teachers learned Bruner's Concept Attainment strategy during the first three-hour sessions (which included readings, lectures, multiple demonstrations, and peer teaching with feedback). Because of the wide range of subjects taught by the trainees, each teacher then chose one additional model of teaching to master during the next three sessions. Choices included Taba's Inductive Thinking strategy, Gordon's Synectics, and the Training Model (Joyce and Weil 1980). Bruner's Concept Attainment strategy focuses on student categorizing activity-- students learning to identify and place events into classes on the basis of using certain cues and ignoring others. In this model of teaching, the teacher presents data structured to facilitate identification of a concept by students, tests attainment of the concept by providing additional "unlabeled" data, and assists students in analyzing their thinking strategies. In Taba's Inductive Thinking strategy, the teacher, through eliciting questions, moves the students from concept formation to interpretation of data and application of principles. For older students, emphasis is on the latter two activities. Synectics requires analogic thinking by students in a series of teacher-led analogy-producing activities, culminating in applications to both imaginative and critical writing.

An interview was conducted with each project teacher at the end of initial training.

The peer coaches received approximately 18 hours of training (for four of the peer coaches, this was spread over a six-week period, while for the other

two it was conducted during an intensive two-day period). Session one included the completion of a questionnaire and review of the models trainees were currently learning. Session two included presentation of findings from the previous year's study of coaching and role playing of initial interviews with trainees. Session three was devoted to administration of the Conceptual Level Paragraph Completion test and demonstrations of strategies for providing support and encouragement to trainees, the range of possible student responses to the strategies, classroom management questions likely to arise with these models, and interpersonal communications skills (with role playing among the peer coaches). Session five was devoted to viewing video tapes of the models about which the peer coaches would be providing feedback, and discussion of the appropriateness of the strategies for various instructional objectives. Session six focused on generating examples of appropriate lessons for various strategies in multiple subject areas, the importance of confidentiality when dealing with trainees' concerns and problems, and logistics for the next few months (weekly staff meetings, scheduling of observations and conferences, record keeping). A partial set of materials used in the training of peer coaches appears in Appendix A.

Phase II - Peer Coaching

In late March through mid-May, 1983, 15 of the 21 teachers in the initial training group received a coaching treatment designed to boost their level of implementation of the new strategies. Three of the peer coaches each coached three trainees while the other three peer coaches each worked with two trainees. Each peer coach observed and conferenced with their trainees once each week during Phase II of the project. Uncoached teachers were observed three times

during Phase II.

Weekly conferences between peer coaches and their trainees followed pre-conference observations of lessons in trainees' classrooms. Conferences focused on planning for appropriate use of the new models of teaching, teachers' educational objectives for teaching specific subject matter, and discussion of strategies best suited for achieving objectives. Peer coaches received feedback and assistance from project staff as they implemented the coaching treatment.

Peer coaches were provided substitutes for the days or partial days they spent in observation and conferences through a subcontract to their districts.

During Phase II, all teacher trainees were observed three times with TIS and kept logs recording their use and evaluation of trials with the models they had learned during initial training.

Phase III - Transfer Task

In late May, the 11 language arts and social studies teachers each taught a one-week experimental unit to one class of students, and students were tested over the unit material. Students of the other eight project teachers were administered a concept attainment test.

A final interview was administered to teachers and peer coaches in early June.

RESULTS

The present study investigated the ability of peer coaches to train their fellow teachers in the classroom application of new teaching strategies. Specific questions addressed the transfer of training rates for coached and uncoached teachers and the relationship of transfer of training to student outcomes.

Peer Coaching

Peer coaches were instructed to provide support and encouragement to their teachers as they attempted new models of teaching, to provide technical feedback on the congruence of model trials with ideal performances, to analyze with teachers the appropriateness of models for various curricular applications, and to discuss with teachers adaptations of the strategies to students (see Appendix A for Peer Coaching training materials). For peer coaches, the importance of adapting these elements for individual teacher differences was also stressed, e.g., some teachers feel more anxious than others when attempting new behaviors and therefore need more support and reassurance during early trials with a new model of teaching. Finally, peer coaches were expected to move the coaching relationship to one of mutual give and take as teachers became less dependent upon their coaches' greater knowledge and experience with the strategies.

Fidelity to coaching model. Using transcripts of coaching conferences, peer coaches' fidelity to the coaching model was judged against four criteria: 1) the degree of support and encouragement they provided to their teachers as they attempted to integrate new teaching strategies into instructional practice, and their ability to modulate support for teachers according to individual differences; 2) the quality of technical feedback provided on new models of teaching; 3) analysis of the application of new models to curriculum areas and assistance with lesson planning; and 4) assistance in adapting new teaching models for students unaccustomed to the models and the behaviors expected of them with the new models of teaching.

All six of the peer coaches engaged in the "coaching" behaviors they were trained to use, although with varying degrees of skill and consistency (see

Table 5). Providing support and companionship to teachers seemed to be the most natural behavior for the peer coaches and the one most thoroughly developed in their natural repertoires ($\bar{x}$ = 4.17, range = 3 to 5 on a 5-point scale). For two of the peer coaches, a natural tendency to be reinforcing sometimes interfered with their ability to provide accurate feedback on teacher performance following a lesson.

All peer coaches provided technical feedback following lessons taught with the new strategies ($\bar{x}$ = 4.17, range = 3 to 5 on a 5-point scale). The structure provided by the Clinical Assessment Forms facilitated technical feedback, and the modeling provided by the principal investigator during the peer-coach training was remarkably evident in the transcripts of peer-coaching conferences. Peer coaches initially found it difficult to begin the feedback portion of the coaching session but by the end of the treatment period were much more likely to launch immediately into feedback on an observed lesson in order to leave more time for planning future lessons.

Peer coaches varied considerably in the extent to which they analyzed appropriate use of newly-learned strategies within curriculum areas. Even though many teachers acknowledged that determining appropriate occasions for use of the new models was difficult for them, some teachers resisted outside involvement in actual lesson planning. Two of the peer coaches (A and E) also felt inadequate regarding their own abilities to analyze applications of the models and therefore tended to spend more time on other things.

Table 5

Ratings of Peer Coaches' Skills From Transcripts of Coaching Conferences (Scale 1-5; 1 = low; 5 = high)

Peer Coach	Support	Technical Feedback	Analysis of Application	Adaptation to Students	x's
A	5	3	3	4	3.75
B	4	5	5	3	4.25
C	4	4	5	3	4.0
D	4	4	4	5	4.25
E	5	4	3	3	3.75
F	3	5	5	4	4.25
$\bar{x}$	4.17	4.17	4.17	3.67	
S.D.	.75	.75	.98	.82	

For the three teachers who shared the same subject areas as their coach, analysis of application as an activity seemed to progress smoothly earlier than for some of the mismatched-by-subject pairs. However, no generalizations are made or implied here regarding the matching of peer coaches and teachers on the basis of common subject areas, as nearly every pair eventually agreed on optimal amounts of this activity for their own comfort within the coaching relationship. At the end of the project, four of the 15 coached teachers reported that analysis of application had been the most useful and essential part of the experience for them, while three teachers said all the coaching elements had been equally useful and essential. (Seven teachers reported that feedback had been the most useful coaching element for them, although analysis of transcripts from coaching conferences suggests some confusion of feedback with analysis of application.)

Peer coaches also varied considerably in their attention to student responses to new models. Only peer coach D consistently noted for his teachers students' difficulties with the new models of teaching, and when difficulties were present, suggested ways of adapting the strategies to students and/or directly teaching students more effective coping behaviors. As a group, the peer coaches experienced almost no classroom management problems in their own classrooms. They seemed somewhat unconscious of their own successful efforts to teach new strategies to their students, and perhaps assumed their teachers would automatically do the same. However, when coached teachers expressed concerns that their students seemed confused or unsure of the different behaviors being requested of them, peer coaches were quick to offer concrete suggestions for modulating teaching strategies to student needs and abilities.

Flexibility and collegiality in the peer coach/trainee relationship. It was stressed with peer coaches during their initial training, as well as during weekly conferences with the principal investigator, that individual differences among teachers would necessitate flexibility. Coaching elements were not to constitute a rigid formula to be applied equally to all teachers but rather a guide to help trainees implement new teaching strategies within their own curriculums with their own students. A difficult and delicate balance was asked of the peer coaches in that they were to respond not only to teachers' needs for support or feedback or analysis of application but also to provide various kinds of help based on their own analyses of teachers' needs. While none of the peer coaches developed this flexibility to a superior degree, all but one learned to flex to difficult teachers' expressed needs and coaches' perception of needs most of the time (see Table 6). Peer coach F's three teachers reported that she

had been perfectly flexible at all times although transcripts of F's coaching conferences revealed no differences from Peer Coaches B through E. Possible explanations for this phenomenon will be discussed later.

A primary goal for the peer coaching relationships was that they would gradually assume the character of collegial interactions. This was a goal not only because of the surface desirability of such relationships but because it was felt that the development of collegiality in these relationships would lead to institutionalization of collaborative teacher planning and studying.

Table 6

Ratings of Peer Coaches' Collegiality and Flexibiity From Transcripts of Coaching Conferences (Scale = 1-5: 1 = low; 5 = high)

Peer Coach	Collegiality of Conferences	Flexibility with Individual Teachers	$\bar{x}$
A	3	3	3.0
B	5	4	4.5
C	3	4	3.5
D	3	4	3.5
E	4	4	4.0
F	5	4	4.5
$\bar{x}$	3.83	3.83	
S.D.	.98	.41	

Transcripts of coaching conferences were thoroughly analyzed to determine if and at what point teachers began controlling or contributing to the agendas of these meetings. Peer Coaches B and F seemed to achieve a high degree of collegiality in their meetings and to attain it early in their relationships. Coach

B, in fact, commented during his second conference with one of his teachers that he seemed to be doing an inordinate amount of talking and urged the teacher to take a more active role. Two of the three peer coaches with the greatest degrees of collegiality in their coaching relationships also spent the greatest amount of time in analysis of application with their teachers. Through the sharing of materials and the planning of actual lessons, these peer coaches seemed to communicate to their teachers that they were colleagues working together on mutually baffling problems. Their teachers repeatedly noted that the coaching experience had been helpful because "two heads are better than one" when trying to solve problems.

Teacher perceptions of peer coaches. At the close of the project, we asked all coached teachers how much of the coaching conferences had been spent in the various coaching elements and what they would consider to be optimal amounts of time spent in these behaviors (see Table 7). While it is difficult to determine if peer coaches flexed to meet teachers' needs, accurately perceived teachers' needs, or were pulled by teachers to provide what teachers wanted (in much the same fashion students pull teachers to meet their own expectations regarding teacher behavior), teachers on the whole felt they had received exactly what they wanted and needed. Variations within peer coaches' behaviors for different teachers would support any of these hypotheses.

Peer Coach Perceptions of Training/Coaching

Prior to the start of the coaching treatment, four of the six peer coaches expressed anxiety about their ability to provide coaching to their peers and about the teachers' receptions of their efforts. All of the peer coaches felt their own expertise in the strategies was inadequate for the coaching role,

Table 7

Coached Teachers' Perceptions of Actual and Ideal Percentages of Peer-Coaching Behaviors

Peer Coach	Teacher	Support		Feedback		Analysis of Application	
		Actual	Ideal	Actual	Ideal	Actual	Ideal
A	1	.50	.40	.25	.30	.25	.30
	2	.50	.30	.20	.50	.30	.20
B	1	.33	.20	.33	.40	.33	.40
	2	.20	.20	.60	.50	.20	.30
C	1	.20	.20	.20	.20	.60	.60
	2	.20	.30	.30	.30	.50	.40
D	1	.40	.20	.20	.50	.40	.30
	2	.10	.33	.50	.33	.40	.33
	3	.30	.30	.50	.50	.20	.20
E	1	.40	.30	.40	.40	.20	.30
	2	.33	.30	.33	.40	.33	.30
	3	.50	.45	.40	.55	.10	.00
F	1	.40	.40	.40	.40	.20	.20
	2	.40	.40	.35	.30	.25	.30
	3	.40	.40	.20	.20	.40	.40
	$\bar{x}$	.34	.31	.34	.38	.31	.30
	S.D.	.12	.08	.12	.11	.13	.13

despite reassurances that their own skills would continue to improve.

At the close of the project, four of the six peer coaches reported that their most difficult task was to help teachers find appropriate uses for the new strategies in the context of the teachers' curriculums. The major concern for one peer coach continued to be his own expertise (or perceived lack of expertise) with the teaching models. The greatest difficulty reported by the remaining peer coach was logistical, the scheduling of observations and conferences in a school with a constantly changing schedule.

Peer coaches rated their training more highly at the end of the project than at the end of their initial training. Role playing of coaching conferences was seen as the most valuable training component by peer coaches in June (although as the least valuable in February). Suggestions for future training included more time spent on role playing, although they suggested future peer coaches might resist it at the time. Five of the six peer coaches felt they were becoming more proficient in the coaching role and were sorry to have it end just when they felt they were becoming proficient.

The greatest benefit to peer coaches appeared to be increased use of and facility with the strategies they had been coaching in others. Typical comments were: "Now I always think of alternatives before choosing how I will teach a lesson," "I'm more confident with the strategies in my own classroom, I've learned so much from observing others," "I've used the strategies more in my own room and now feel I can play to the strengths of different sets of students," "Observing others keeps the strategies in my mind all the time so I use them more myself."

Peer coaches uniformly believed they had learned more and grown more than

their trainees as a result of the coaching experience. Four of the peer coaches also believed they had achieved greater collegiality with their peers because the coaching conferences had established new norms for what they discussed with their peers.

Summary

There seems little doubt that teachers can be trained to coach their peers in a school environment. All peer coaches were full-time teachers during this project and were released by project funds for the number of periods needed each week for observations of and conferences with their trainees. Although several peer coaches expressed concern at the beginning of the treatment phase about possible repercussions of seeming to be in a "superior" role with their peers, all managed to overcome these anxieties during the course of the coaching period. Furthermore, teachers uniformly reported that, despite early anxieties about peer observations in their classrooms, the peer coaches had conducted themselves professionally in the very best sense of the term. The experience proved to be positive for both peer coaches and teacher trainees.

Peer Coaching and Transfer of Training

The second major question addressed by this study was the relationship of peer coaching to teacher trainees' transfer of training. Transfer of training is a complex measure comprised of skill level attained, appropriateness of use of newly-learned strategies, comfort of students with the new strategies, and practice with the trained models of teaching. It was hypothesized that teachers who received peer coaching following initial training with new models of teaching would transfer those models into their active teaching repertoires at a greater rate than teachers who did not receive peer coaching following initial

training. Furthermore, it was hypothesized that transfer of training rates for peer-coached teachers would be equivalent to those attained by consultant-coached teachers in an earlier study (Showers 1982).

TIS observations, observers' notes, teacher logs, lesson plans, and interviews were the basis for ratings of teacher skill, appropriateness of use, student comfort, and practice rates.

Skill levels. At baseline, teachers were employing basically a recitation teaching style, with teacher statements and questions (teacher talk) comprising slightly more than two-thirds of all classroom verbal behavior. Furthermore, during baseline observations teachers were spending 37 percent of classroom time in structuring behavior, 49 percent in information processing, and 13 percent in feedback behaviors. Conceptual and theoretical level information processing interchanges were nearly nonexistant during the baseline period (see Table 8).

Baseline behavior for teachers in the present project was remarkably similar to that for 1982 project teachers (see Table 8), and apparently, for American teachers in general (Sirotnik 1983). The major difference in the two samples was the presence of some conceptual level information processing at baseline in the 1982 sample, while the behavior occurred very infrequently at baseline in the 1983 sample. Thus, the peer coaches were facing basically the same task that Showers (1982) faced a year earlier, that of assisting teachers in mastering and integrating new behaviors into their teaching repertoires.

Effects of Initial Training. In the winter of 1983, all project teachers were taught Concept Attainment and either Inductive Thinking (Taba), synectics, or a training model (the training model was taught to teachers of P.E., Home Economics, etc.). Approximately two to three weeks following instruction in a

Table 8

Percentages for Teacher Behavior on TIS Scales at Baseline, 1982 and 1983

	Str	Info	Fdbk	Fac	Con	Theo
1982 Baseline (n = 17)	35%	51%	14%	87%	13%	---
1983 Baseline (n = 18)	37%	49%	13%	96%	4%	---

Str - Teacher structuring communications
Info - Total teacher and student information processing
Fdbk - Teacher feedback to students
Fac - Teacher and student information processing at the factual level
Con - Teacher and student information processing at the conceptual level
Theo - Teacher and student information processing at the theoretical level

model of teaching, teachers were asked to demonstrate the strategy with a class of students. TIS observations at these points were used to determine skill levels with the strategies, to check for the fit between ideal and actual behavior patterns. Although each of the models of teaching studied differed from each other in the behaviors required by teachers and students, all had certain characteristics in common: increased opportunities for student statements and questions, greater emphases on information processing than either structuring or feedback behaviors, and the requirement for information processing at levels other than factual or recall.

Table 9 illustrates the initial effects of training in models of teaching (as compared with Baseline behavior) on the TIS observation system. Although teacher behaviors for the new strategies were not identical with ideal patterns for each of the strategies, teachers generally moved in the direction prescribed by each of the models.

At Baseline, teacher talk accounted for 70 percent of all classroom discourse; 37 percent of all classroom discourse was structuring behavior, 49 percent was information processing, and 13 percent was feedback. Ninety-six percent of information processing was at the factual/recall level. During initial trials with the new strategies, teacher talk for Concept Attainment, Taba, and Synectics respectively was 70 percent, 63 percent and 59 percent. Feedback patterns varied only slightly from Baseline during initial trials with the new teaching models (range = 12 percent to 16 percent of total discourse) but time devoted to structuring decreased significantly (range = 21 percent to 29 percent for models as compared with 37 percent of total discourse at Baseline). Furthermore, time devoted to information processing increased significantly during initial trials

Table 9

Mean Frequencies* for Teacher Behaviors on TIS Indicies at Baseline and During Skill Training

	TS	TQ	SS	SQ	STR	InPr	FdBk	Fac	Con	Theo
Baseline (n = 18)	40.84	13.40	18.80	4.85	29.14	38.38	10.38	35.18	1.51	.09
Skills Training										
Concept Att'mt (n = 17)	34.41	19.17	20.36	2.82	18.74	48.91	9.10	22.57	24.58	.09
Taba (n = 5)	26.80	14.31	21.58	2.96	18.81	38.52	8.32	23.93	10.65	1.34
Synectics	30.90	17.25	29.72	3.03	17.21	50.56	13.14	9.75	38.92	0.00

TS - Teacher Statements
TQ - Teacher Questions
SS - Student Statements
SQ - Student Questions

STR - Structuring Communications
InPr- Information Processing Communication
FdBk- Feedback Communications

Fac - Factual level information processing
Con - Conceptual level information processing
Theo- Theoretical level information processing

*Mean frequencies are mathematically adjusted for length of lessons, e.g., total number of communications in each category were divided by minutes of instruction and multiplied by a common factor to make mean indices comparable across teachers.

with the new strategies (range = 59 percent to 64 percent as compared with 49 percent of discourse at Baseline).

While 96 percent of information processing was at the factual level during Baseline observations, the distribution of information processing during initial trials with Concept Attainment, Taba, and Synectics respectively was 48 percent for factual level, 52 percent for conceptual level; 66 percent factual, 30 percent conceptual and 4 percent theoretical; and 20 percent factual and 80 percent conceptual.

Thus, while initial training did not dramatically change ratios of teacher talk to student talk for all strategies, it significantly decreased time spent on structuring behavior, increased time spent on information processing in general, and particularly, increased rates of higher-order information processing.

Peer Coaching and Skill Acquisition. Following the first two phases of the TIS data collections (Baseline observations prior to training and skills checks immediately following initial training in new models of teaching), 15 of the 21 project teachers were assigned to peer coaches. Two teachers (one coached and one uncoached) were dropped from these analyses because their assignments placed them with continually shifting samples of students. At the end of the project, 10 of the 14 coached teachers were classified as "coached," while four of the coached teachers were classified as "partially coached". This distinction reflected the following realities.

"Coached" teachers were observed by and met weekly with their peer coaches, as prescribed by the treatment. Observation periods often included practice with the new models of teaching, and conferences focused on the mastery of the

new strategies and their integration with existing instructional repertoires.

For the four "partially coached" teachers, however, quite different patterns of interaction emerged. Observations and conferences occured erratically, with teachers sometimes cancelling both for as long as four consecutive weeks. In other cases, teachers postponed examining the potential uses of the new strategies with their curriculum until current units of work were completed ("I'll have to finish this six-week unit on clauses and phrases before thinking about the new strategies. This unit is already planned."). Consequently, even when peer coaches were able to meet weekly with these trainees, the content of conferences was unfocused with respect to the object of the coaching.

Table 10 illustrates several differences in instructional patterns exhibited by coached, partially coached, and uncoached teachers during all phases of the project. Although teachers were not yet assigned to treatment groups during Baseline and initial skills training, teaching patterns for those periods were later examined by treatment groups to determine if initial differences existed among the three groups.*

Levels of information processing were chosen to illustrate variations in skill levels between treatment groups (Table 10). At baseline uncoached teachers engaged in more information processing overall than either coached or partially-coached teachers. However, information processing for all groups was primarily at the factual/recall level.

Skill checks during and immediately following initial training revealed substantial differences in information processing for all teachers. While the coaching treatment had not yet begun at this point in the project, teachers who would subsequently be assigned to a peer-coaching treatment generated more

Table 10

Mean Frequences for Three Levels of Information Processing for Coached, Partially-coached and Uncoached Teachers at Baseline, Skill Check, Treatment, and Transfer Task

		Coached (N = 10)			Partially Coached (n = 4)			Uncoached (n = 5)		
		Fac	Con	Theo	Fac	Con	Theo	Fac	Con	Theo
Baseline	$\bar{x}$	46.31	2.75	0.19	37	0.00	0.00	63.3	0.10	0.00
	S.D.	(22.57)	(4.58)	(.75)	(26.51)	(--)	(--)	(38.5)	(.32)	(--)
Skill Check	$\bar{x}$	32.98	36.88	0.00	31.00	29.2	0.00	17.02	25.50	0.00
	S.D.	16.95	17.35	0.00	34.28	34.16	0.00	13.82	13.08	0.00
Treatment	$\bar{x}$	52.72	44.88	0.40	39.12	20.67	0.00	68.0	14.75	0.00
	S.D.	16.24	31.85	0.67	30.51	9.37	0.00	60.3	10.28	0.00
Transfer Test*	$\bar{x}$	39.24	18.00	.95				37.90	10.09	0.00
	S.D.	37.44	18.29	3.93				22.65	13.17	0.00

* Only 11 teachers (7 coached, 4 uncoached) taught a week-long unti for the transfer task. The remaining 8 teachers' (3 coached, 4 partially coached, 1 uncoached) students were administered an independent concept attainment task.

classroom interchanges at the conceptual level than did teachers who would be uncoached. However, all teachers during this period exhibited information processing teaching patterns radically different from those observed at baseline.

During a transfer task in which 7 coached and 4 uncoached teachers taught a one-week unit to their classes and were free to use whatever strategies they preferred, coached teachers as a group exhibited 67 percent factual information processing, 31 percent conceptual and 1 percent theoretical, while uncoached teachers exhibited 79 percent factual information processing and 21 percent conceptual.

Thus, skill in the new strategies, as measured by TIS indices for information processing, was established for all teachers during initial training, was maintained at higher levels for coached teachers during the treatment period, and was more in evidence for coached teachers during a transfer task, although uncoached teachers were able in a "test" situation to exhibit a better ratio of conceptual to factual level information processing than they had during the treatment phase.

Appropriateness, Comfort, Use. In addition to skill acquired with the new models of teaching, three additional factors were also considered in the computation of transfer of training scores: appropriateness of use of the strategies, student comfort with and adaptation to the new models, and teacher frequency of use (practice). Transfer of training scores were computed by adding for each teacher his or her scores for skill (possible 1 - 5 points), appropriateness of use (1-5 points), student comfort with the new strategies (1-5 points), and number of practice trials with the new models of teaching (1-3 points). A perfect transfer of training score would be 18.

Appropriateness. After developing complex teaching skills in strategies quite different from their normative teaching styles, the next more difficult task for most teachers in integrating a new strategy with classroom instruction is appropriate use of the new strategy. Selecting appropriate occasions for use and effectively employing the new strategies is a complex decision-making task. For example, if a teacher has mastered the Concept Attainment (CA) and Inductive Thinking (IT) strategies, he or she must determine what are the central concepts in a curriculum area for which CA will be most efficient, what categories of information must be introduced before students can draw inferences regarding cause/effect relationships with an IT strategy, and what materials will be needed to supplement text materials. While skill with a strategy has implications for how well students can respond to it, decisions regarding when and for what to employ a strategy are an important element in eventual integration of a teaching model with existing repertoire.

In this study, records of use (lesson plans, materials, evaluations of lessons) were examined along with interview data to determine appropriateness of use scores. Each lesson was rated on a five point scale for its fit with the teacher's stated objectives, appropriateness of curriculum materials for the model chosen, and the integration of the new models with other strategies used in an instructional sequence. A mean appropriateness score was then computed for each teacher. This score was not affected by skill with which the models were demonstrated or by the number of trials attempted.

Student comfort with the new models. Perhaps one of the most important elements in a teacher's ability to transfer new strategies to regular and appropriate classroom practice is his or her ability to teach students to respond

to a new strategy comfortably and confidently. If students are frightened by the demands imposed by unfamiliar teaching strategies, each successive trial with the strategy can become increasingly aversive for teachers and students alike. Consequently, teachers were rated on their ability to teach the component skills of any given teaching strategy so that students not only could respond appropriately to the demands of a new instructional situation but could do so with some confidence.

Anecdotal data colleced by observers during TIS observation sessions and interviews with teachers were examined to determine student comfort levels. Each lesson observed was rated on a scale of 1 (low) to 5 (high) on this dimension and scores were adjusted by teacher-reported data in interviews. Examples of low comfort scores were verbal resistance on the part of students ("Are we doing this again? I never understand what we're doing"), failure of students to respond to a lesson, or high participation by only a handful of students in the classroom. High comfort scores, on the other hand, were characterized by high participation rates by all students (of all ability levels), statements of confidence by the students ("Oh I know how to do this. I always ace this kind of lesson."), and by serious engagement with the task (almost no off-task behavior). (See table 11 for comfort scores). Interestingly, teachers who were somewhat dubious about any model that departed radically from the recitation, both in its demands on them and their students, seemed to communicate that reticence to their students. Somehow, students in these classes intuited that experimental thinking was not really appropriate and was, in fact, off-task behavior. This was particularly true in strategies that emphasized open-ended approaches to problem solving rather than one right answer.

For example, two teachers might both present the same factual information to students about the American electoral process. Teacher one might then ask students to hypothesize about possible implications of various rule changes in the functioning of the electoral college while teacher two might conduct a recitation in which students were required to recall the facts earlier presented. Teacher one would be communicating to his or her students that all questions do not have one right answer and that it is acceptable student behavior to theorize about possible outcomes of specified events. In this study, teachers who shared the values of teacher one regarding the nature of knowledge were more likely to teach their students to relate comfortably to the new teaching models teachers were learning.

Practice with the New Strategies. The final component of the transfer score was number of trials with the new strategies. We had hypothesized that unless teachers practiced the new teaching models with their students fairly frequently, they would be unable to develop the necessary skills and cognitions regarding appropriate use necessary for transfer of the new strategies into readily accessible repertoire. Furthermore, we imagined that without multiple opportunities to respond to the new strategies, students would be unable to develop comfort and confidence with the new teaching models.

Practice trials with a strategy of from 0 to 5 were assigned a 1 for the transfer score, 6 to 10 trials were assigned a 2, and 11 or more trials were assigned a 3.

Table 11 presents the mean scores for transfer of training elements for coached, partially coached, and uncoached teachers. The effects of peer coaching on transfer of training become more understandable when we examine group dif-

Table 11

Mean Scores of Coached, Partially Coached and Uncoached Teachers on Components of Transfer Scores

		Coached N = 10	Partially Coached (n = 4)	Uncoached (n = 5)
Skill (scale: 1-5)	$\bar{x}$	3.54	2.41	2.46
	S.D.	.84	.31	.38
Appropriateness of Use (scale: 1-5)	$\bar{x}$	3.65	2.82	2.90
	S.D.	.63	.21	.34
Student Comfort (scale: 1-5)	$\bar{x}$	3.45	1.87	2.00
	S.D.	.72	.25	.93
Practice (scale: 1-3)	$\bar{x}$	2.10	1.50	2.20
	S.D.	.57	.58	.84

ferences by transfer components. Although uncoached teachers practiced the new strategies as much as did the coached teachers, skill development, appropriate use, and levels of student comfort were higher for the coached teachers. This disparity in scores suggests that practice without feedback was not efficient for developing all the skills and cognitions thought to be necessary to integrate new teaching strategies with existing teaching behaviors. The partially coached teachers, who had access to peer coaches but resisted the coaching process, had scores almost identical with those of the uncoached teachers except, as a group, they practiced the new strategies less.

Table 12 presents total transfer of training scores for coached, partially coached, and uncoached teachers. While we can say that on the whole, peer coaching increases significantly the ability of teachers to transfer new models of teaching into their instructional repertoires, these data also make clear that peer coaching will not be effective for those teachers whose anxiety and discomfort with the process prevent their full participation in the process.

Transfer of Training and Student Outcomes

The third major objective of this study was to determine the effects on student outcomes of teachers' transfer of new strategies to classroom practice. Specifically, two questions were addressed:

-- If teachers used a new model of teaching frequently (at least once a week for a two-month period), would their students become more adept at using the strategy independently than students of teachers who used the strategy only during the initial training period but did not transfer it to their teaching repertoire?

-- Would teachers with high transfer of training scores choose

Table 12

Composite Transfer of Training Scores for
Coached, Partially Coached and Uncoached Teachers

		Coached	Partially Coached	Uncoached
		(n-10)	(n=4)	(n=5)
Transfer Scores (1-18)	$\bar{x}$	12.74	8.61	9.56
	S.D.	2.17	.42	1.27

to use the new models of teaching for the experimental one-week unit? Would student scores on the unit test be positively associated with their teachers' transfer of training scores?

Concept Attainment Outcomes

The classes of eight project teachers who taught subjects other than language arts or social studies were selected to examine the first question. Rather than ask these teachers to teach a one-week unit unrelated to their subject areas, we administered a concept attainment test to their students. All eight classes were administered the same test by a member of the project staff. The test required only one class session (approximately 40 minutes).

The Concept Attainment Test required students to apply the concept attainment strategy independently to new material. Positive and negative exemplars of the concept were presented and students were asked to determine the concept, list its attributes, provide examples and non-examples of the concept, and write a paragraph exploring the application of the concept to a new situation. Behaviors required of students on this test were identical to those their teachers would have requested had they directly taught the material using the concept attainment strategy. Because the test required each student to read independently all examples and directions, final scores were adjusted with student verbal ability scores.

Student responses to the concept attainment test were analogous to essay tests. As each student read through the test and reported his or her thinking regarding the nature of the concept represented by the examples, student responses varied considerably. Scoring of the tests was done by four "blind" raters who knew neither the identity of the student nor the student's teacher. Directions

for test raters included five criteria for each answer that detailed the elements that should be included for complete responses. Inter-rater reliability coefficients for 16 tests chosen at random from the pool of 169 tests ranged from .62 to .87 for all possible pairs of raters. The overall inter-rater reliability coefficient for all raters was .88 (Cronbach's Alpha).

Student data on the Concept Attainment Test were examined in two ways--with the class (teacher) as the unit of analysis and with the student as the unit of analysis.

Class means were computed for each teacher and correlated with teachers' total transfer of training scores and the components of the transfer of training scores (see Table 13). Three findings were of interest here. First, students were much more able to use the concept attainment strategy independently if their teachers had transferred the strategy to their teaching repertoire. Test papers of students of low transfer teachers were littered with comments like "We haven't done this for a long time," "I'm not sure what you want here," and "This is a weird test." On the other hand, students of high transfer teachers were likely to write on their tests comments like "This is fun. We've never done it without the teacher before," "I always figure these out," and "This is a cool test." (We did not solicit student comments in the main body of the test, although the last page asked students to rate the frequency of use of concept attainment in their class and their attitude toward the strategy.)

Second, although student verbal ability was expected to account for much of the variance in student scores on the concept attainment test, it was less powerful than is normally the case. Student verbal ability was actually negatively correlated with teacher transfer of training scores, although

Table 13

Correlation of Mean Student Concept Attainment and Verbal Ability Scores with Teacher Transfer of Training Scores (n = 8 classes)

		Mean Student C.A. Scores	Mean Student Verbal Ability Scores
Total Transfer of Training Scores	r	.80	-.27
	p	.008**	.256
Skill with Models	r	.62	-.27
	p	.049*	.258
Appropriateness of Use	r	.71	-.55
	p	.025*	.078
Comfort with Models	r	.67	-.39
	p	.034	.166
Frequency of Use	r	.45	.49
	p	.133	.109

* significant at .05 level
** significant at .01 level

positively correlated with student outcome scores. (Student ability scores would not be expected to correlate with teacher characteristics, of course. These correlations were computed only to determine if high transfer teachers had somehow been assigned students with higher than average verbal ability.) On this task, familiarity with the strategy appeared to compensate for reading difficulties to some degree, and high ability students who had not had the opportunity to internalize the strategy were less able, on the strength of verbal ability alone, to perform the required tasks.

Finally, teachers who simply used the strategy frequently but who had not mastered the other elements of transfer--technical skill with the model, ability to use the model appropriately in terms of curriculum and student characteristics, helping students become comfortable with the model--did not enable their students to use the strategy independently much better than teachers who quit practicing altogether after the initial training period.

To examine the contributions of teacher training condition and degree of transfer of training to student scores on the concept attainment measure (covarying on student verbal ability), an analysis of variance was calculated, with students as the unit of analysis. Results of the ANOVA (Table 14) show significant contributions for student verbal ability and teacher transfer of training but a non-significant contribution of treatment condition to student outcomes on the concept attainment measure. To further explore the relationship between treatment condition and student outcomes on the concept attainment task, teachers were again classified as coached, partially coached and uncoached (see the Peer Coaching section for complete explanation of these treatment categories). A second ANOVA was computed (again using students as the unit of analysis) in

Table 14

ANOVA: Concept Attainment Scores
By Teacher Treatment and Transfer of Training
with Student Verbal Ability
(n = 138 students)

Source of Variation	df	F	Significance of F
Covariate			
Student Verbal Ability	1	5.69	.018
Main Effects			
Teacher Treatment: Coached or Uncoached	1	1.56	.213
Teacher Transfer of Training	1	5.47	.021
Explained Variance	3	3.92	.010

which teacher treatment was examined in relation to student concept attainment scores with student verbal ability covaried (Table 15). When teacher treatment was classified more accurately to reflect true treatment conditions, coaching significantly contributed to higher student achievement scores on the concept attainment measure.

Experimental Unit Outcomes

Eleven project teachers (seven coached, four uncoached) taught a one-week unit on Banbury, England to one class of students. Students were administered a test over the unit at the end of the week by project staff. The objective test was comprised of 24 items, of which 12 required factual recall of material taught in the unit, 6 asked for definitions of terms, and 6 probed understanding of concepts and relationships.

Coached teachers, regardless of transfer levels, were more likely than uncoached teachers to use newly acquired models of teaching in their instruction of the Banbury unit. The seven coached teachers used the new strategies 12 times during the week's lessons while the four uncoached teachers used the new models only 3 times.

Table 16 presents raw scores for the classes of coached and uncoached teachers on the total Banbury test as well as the sub-tests. Students of coached teachers performed only slightly better than students of uncoached teachers on the Banbury scores.

Student scores on the Banbury test correlated only .05 with teacher transfer of training scores, and .03 with teacher treatment condition. Student verbal ability correlated .52 with Banbury test scores and thus accounted for much of the variance of these scores.

Table 15

ANOVA: Teacher Treatment Conditions on Student Concept Attainment Scores with Student Verbal Ability Covaried (n = 138 students)

Source of Variation	df	F	Significance of F
Covariate			
Student Verbal Ability	1	5.79	.017
Main Effects			
Teacher Treatment Condition (coached, partially coached, uncoached)	2	4.34	.015
Explained Variance	3	4.83	.003

Table 16

Mean Raw Scores on Banbury Unit Test
for Students of Coached and Uncoached Teachers

	Coached (n = 7 classes)	Uncoached (n = 4 classes)
Total Banbury Score	15.13 (2.59)	14.15 (2.44)
Factual Score	7.53 (1.21)	6.6 (1.3)
Definitions Score	3.58 (.61)	3.58 (.80)
Concepts Score	4.04 (.82)	4.01 (.99)

Conceptual Level and Transfer of Training

All teachers were administered a Conceptual Level test at the beginning of the initial training period. However, these scores were not a factor in assigning teachers to peer coaches because of a practical consideration (proximity of peer coaches to trainees).

Table 17 shows the mean CL and Transfer of Training scores for coached, partially coached, and uncoached teachers. As in a previous study of coaching effects on transfer of training, CL alone did not predict transfer of training. While none of the groups of teachers had exceptionally high CL scores, the coached teachers as a group had the lowest CL scores and the highest transfer scores.

Table 17

Mean CL and Transfer of Training Scores for Coached, Partially Coached, and Uncoached Teachers

		Coached (n=10)	Partially Coached (n=4)	Uncoached (n=5)
CL	$\bar{x}$	1.82	2.25	2.06
	S.D.	.29	.21	.38
Transfer	$\bar{x}$	12.74	8.61	9.56
	S.D.	2.17	.42	1.27

DISCUSSION

This study investigated the feasibility of training teachers to provide coaching to their peers following intensive training in new models of teaching and the effects of a peer coaching program on teachers' transfer of new strategies into their instructional repertoires. In addition, students of coached and uncoached teachers were administered both general and model-specific tests in order to examine the relationships between treatment, transfer of training, and student outcomes. The following discussion considers factors that appear to have influenced the results.

The Training of Peer Coaches

There seems to be little doubt that peer coaches can be trained in a relatively brief period to provide follow-up training to other teachers. Peer coaches learned to provide support and encouragement to trainees, technical feedback on performance of models, analysis of applications of new models of teaching in the classroom, and assistance with adapting new strategies to students.

Several factors appear to have been particularly important to the peer-coach

training.

The continuing access to a consultant, in the form of weekly staff meetings, was perceived by the peer coaches as essential. It is possible that peer coaches gained as much from opportunities to share concerns and experiences with each other as from more formal consultation. However, it is probably as important to provide some mechanism for continued training/support for peer coaches as for teacher trainees.

In the beginning of the peer coaching treatment, some peer coaches were more hesitant than an outside consultant to structure teachers to practice strategies. Thus, the treatment was not uniform for all teachers. Whereas in the previous year a consultant had insisted (pleasantly) that all teachers begin practicing new models at once, this role was much harder for peer coaches to adopt. They did not feel free to "pressure" their friends and colleagues to do anything. Consequently, a dual treatment emerged--one for coached teachers and one for "partially-coached" teachers.

All the peer coaches had completed prior training in the strategies new trainees were learning, yet all the peer coaches expressed feelings of inadequacy regarding the content they were to be coaching. It is advisable that peer coach training include continuing work on the content of training as well as the process of coaching. Even though the peer coaches were more knowledgeable than the new trainees on the specific models of teaching being learned, they became increasingly aware of the complexity and potential of the strategies and of the disparity between their own performance of the strategies compared with what was possible. During the period in which peer coaches were observing in other teachers' classrooms and providing feedback and assistance to their peers, they

used the strategies in their own classrooms more frequently, skillfully, and appropriately than any of the teachers they were coaching. They became, in effect, their own best students as they coached themselves to the next level of mastery.

Fullan and Pomfret (1977), in their review of curriculum implementations, noted that changes involving new roles are most difficult to accomplish. The implementation of a peer coaching program involves new roles for both peer coaches and teacher trainees, and the success of such a program depends on the ability of all actors to perform new roles. In the present study, collegial relationships were the target behaviors.

Finally, all peer coaches were seen by their trainees as helpful and professional in their conduct. Successful peer coaching relationships do not appear to depend on established friendship patterns to accomplish their learning tasks. It was interesting to observe, however, that Peer Coach F, who was popular with and respected by her entire faculty, received perfect ratings from her trainees on ability to flex to teachers needs and requests. Transcripts of coaching conferences revealed no substantive differences in F's flexibility when compared with the other peer coaches. It is probable that personal feelings toward peer coaches influenced teachers' perceptions of peer-coach effectiveness. However, the unanimous judgment of trainees regarding the peer coaching experience suggests that peers can be trained to interact professionally and efficaciously with their fellow teachers without massive juggling of schedules to place friends with friends.

Peer Coaching and Transfer of Training

Peer coaching did increase transfer of training ($\bar{x}$ transfer rate for coached

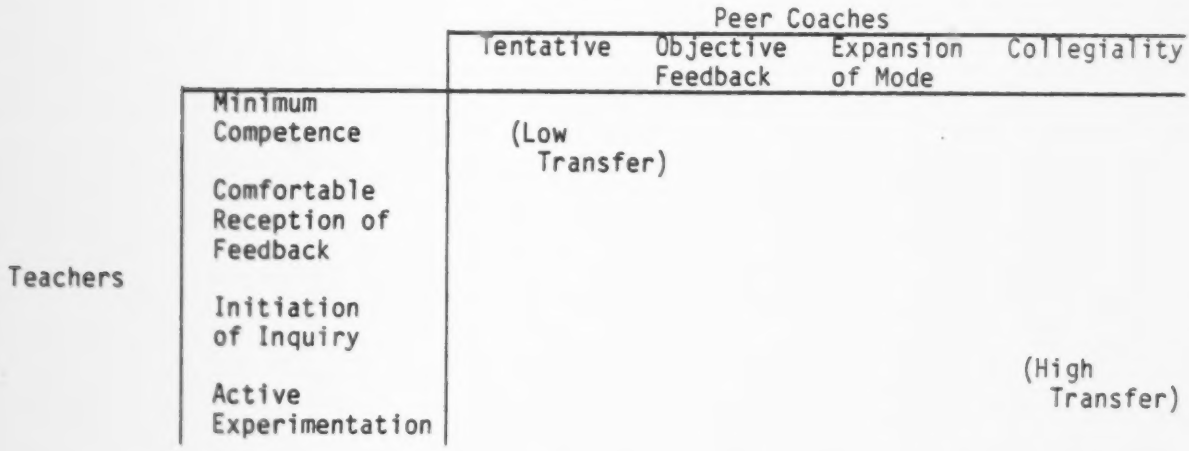
teachers was 12.7 compared with 9.56 for uncoached teachers and 8.61 for partially coached teachers). While in a previous study (Showers 1982) it was hypothesized that coaching increased transfer of training partially by increasing practice with the new strategies, this did not appear to be the case in the present study. Uncoached teachers practiced as much or more with the new strategies in their classrooms. Their practice, however, did not result in increased skill with the models, more appropriate use of the strategies, or increased student comfort with new instructional patterns. Apparently, for most teachers, practice alone will not ensure transfer of new strategies to classroom practice unless accompanied by feedback that specifically addresses the other elements of transfer.

The power of trainers alerting subjects to the transfer problem was evident in the greater practice exhibited by uncoached teachers in the present study. At the beginning of the initial training period, results from previous studies were shared with all teachers. Teachers were incredulous that earlier subjects had discontinued use of the strategies after such an extended training program and were determined that they would not fall into the same pattern. Furthermore, the uncoached teachers had understood, as did all the teachers at the beginning of the project, that not all teachers would be coached. After peer coaches were assigned, however, several of the uncoached teachers tried to renegotiate their status because they feared they would not receive everything that was possible from training. Their determination to succeed with the new strategies and their knowledge of the effects of coaching from the previous year's study would seem to account for their superior performance, compared with the uncoached sample from the 1982 study.

There were notable differences in the ways teachers responded to peer coaching and in the behaviors exhibited by the peer coaches. Figure 1 suggests a framework for thinking about the interaction of peer coaching and teachers' responses to it.

The behaviors listed under peer coaches correspond to a hierarchy of behaviors displayed by most of the peer coaches in this project. The coaches began the process rather tentatively, almost apologetically. Early audio tapes of coaching conferences documented the uncertainties of peer coaches as they arranged for their early observations and feedback sessions and explained the purposes of the coaching sessions. Once formal observations were begun, conferences initially focused almost entirely on technical feedback of the models observed. Several weeks into the process, coaches began to rely less heavily on the structure provided by model feedback forms and to examine the appropriateness of use of the strategies within various curriculums as well as to seek appropriate uses for the new models. Coaches varied in their skill with and willingness to engage in analysis of use of the strategies, but all coaches engaged in this activity to some degree. Finally, some of the coaches achieved a high degree of collegiality with their trainees. Near the end of the project, they had become partners in experimentation.

Figure 1. Interaction of Peer Coaches and Teachers in the Coaching Process



Teachers also progressed through a hierarchy of behaviors in their responses to coaching, although they exhibited much greater variance within their domain than did peer coaches. All teachers exited initial training with at least minimum competence in the new models of teaching they had learned. Some (partially coached) stayed at this level by resisting the coaching process. Others moved quickly into the coaching format and became quite comfortable with receiving feedback on their performance of the new strategies. It is not clear if the "partially coached" teachers resisted feedback per se, as they tended not to perform the models for observation by their peer coaches. It is possible that they experienced difficulty and anxiety with appropriate use of the strategies to the extent that they could not experiment with the new strategies in their classrooms at all. There are many other possible explanations for their hesitance to participate in the coaching experience, of course.

Teachers who successfully passed through the reception-of-feedback phase of coaching progressed to a stage of inquiry in which they elicited from their peer coaches suggestions regarding use of the new strategies. Finally, some of the

coached teachers moved into a stance of active experimentation in which they tried multiple applications of the strategies in interdisciplinary subjects and eagerly discussed the results with their peer coaches.

Although much additional data would be required to establish results of the various intersections of peer coach and teacher behaviors on this matrix, results of the present study suggest that low transfer of training will occur when coaches and teachers remain at the initial levels of their respective hierarchies and high transfer of training will occur when peer coaches and teachers progress to the higher levels of their hierarchies. What seemed clear from this study was an inability of coaching alone to accomplish transfer of training when teachers chose not to participate fully in the process. Implementation of the coaching treatment was essential for successful transfer.

Transfer of Training and Student Outcomes

Students of coached and uncoached teachers were tested on a model-relevant test and on a general test to determine the relationships between teacher treatment and transfer of training, and student achievement.

The superior achievement of students of coached teachers on the concept attainment measure was a direct test of teachers' ability to teach a model to their students. Students of coached teachers understood the concept attainment strategy well enough to operate independently with it, whereas students of uncoached teachers experienced both difficulty and heightened anxiety on the test. If one of the ultimate tests of transfer of new strategies into instructional practice is teaching students new thinking and responding behaviors, coaching for transfer would seem to be a viable process for increasing transfer.

The findings of no difference for students of coached and uncoached teachers

on the general measure (Experimental Unit) raise several issues. The first is whether general, objective tests of facts, definitions and concepts are appropriate measures for the unique learning behaviors generated by specific models of teaching. Clearly, teachers have other, more traditional ways to teach factual material, and a finely-tuned recitation model can certainly transmit factual material. A second issue concerns the effort expended by all teachers when engaged in a "teaching test." As occurred in an earlier study (Showers 1982), both coached and uncoached teachers threw themselves into the challenge of teaching material to their students for a week, knowing that class achievement would be compared across teachers. The concept attainment test seemed less susceptible to this sort of Hawthorne effect. If we want to measure the effects of analogical teaching or inductive teaching on students' learning, it is probable that model-specific tests requiring analogical or inductive thinking must be employed.

Recommendations

Training peer coaches. The benefits enjoyed by peer coaches in this project suggest that all teachers should be peer coaches. Training for coaching should be integrated with training in teaching strategies, new curriculums, new organizational structures, or whatever the content of training happens to be. Since much of the relevance of the peer-coach training was not understood until peer coaches actually began coaching, concurrent training in content and process should be more efficient than separate training for each. Furthermore, the peer coaches' concern about their competence with the models they were coaching in others supports the notion of concurrent training. This point is especially crucial, as coaching without training in any content is extremely unecono-

mical, if possible at all.

Transfer of training. The greatest difficulty experienced by both peer coaches and teacher trainees appears to be cognitive in nature. The technical elements of new teaching strategies appear to be mastered relatively easily by all learners, but the integration of strategies with curriculum continues to be the most difficult element of transfer for most teachers. Training should focus intensively on "thinking" with new models. Teachers who perform all the moves in an inductive lesson and then consider it a failure because students did not organize data into the "right" categories do not really understand the purpose or intent of the strategy.

Coaching and school improvement. The role of a coaching program in school improvement appears to be facilitative of the professional and collegial relationships discussed by Little (1982). Implementation of a peer coaching program in a school has effects much more far reaching than the mastery and integration of new knowledge and skills for individual teachers. The development of school norms that support the continuous study and improvement of teaching builds capability for any kind of change, whether it is adoption of a new curriculum, school-wide discipline policies, or the building of teaching repertoire. By building permanent structures for collegial relationships, schools can organize themselves for improvement in whatever area they choose.

Implications for leadership. The design and implementation of powerful training systems are unlikely to occur without thoughtful and determined leadership at both the district and building levels. Administrators will have to examine carefully priorities for staff development and the allocation of funds to staff development activities. Whatever the size of a district/school

staff development budget, few budgets can sustain both intensive, focused training and numerous one-shot activities at a very high level of funding. Decisions must be made regarding the outcomes expected of staff development programs. When the desired outcome is simply increased awareness of a subject, funding might legitimately support the occasional two-hour speaker. When, however, the expected outcome of staff development is change in the instruction students receive, funding will probably have to be focused more narrowly in order to support the magnitude of training necessary to bring about that change.

Organization of peer-coaching systems will most likely need to be cooperatively arranged between district administrators and school sites. In schools where teachers already have preparation periods scheduled into their work days, teachers can be organized into coaching teams for collaborative planning and feedback sessions. Some schools have used specialist teachers to release teachers for observation periods, and some principals have taken classes in order to provide observation times for teachers. In other cases, teachers have had to video tape lessons for sharing at a later time when live observations could not be arranged. In the peer coaching study reported here, substitutes were provided for peer coaches one day per week in order for them to complete their observations and conferences. Creative problem-solving by teachers and administrators will almost surely result in solutions to the time demands of the continuous study and analysis of teaching. Without the active support and involvement of building principals, however, few teachers will be able to establish such systems for themselves.

Principals must do more than assist with the logistics of peer-coaching systems if such systems are to become institutionalized. Teachers have so long

worked in isolation that serious distortions have often developed about personal competence. Principals must work to establish new norms that reward collegial planning, public teaching, constructive feedback, and experimentation. Professional growth must be seen as a valuable and expected process and clearly separated from the evaluation of performance.

Not only are principals in a unique position to influence building norms, they are also perfectly situated to facilitate the implementation of peer-coaching systems through collaborative problem-solving with their teachers. Flexible scheduling for training, observation, feedback and planning can be uniquely designed to meet the needs of individual faculties. Available rewards and incentives can be brought to bear to encourage developing norms of collegiality. Support from parents and community members can be solicited by explaining the purpose and expected outcomes of intensive training programs embedded in larger school improvement efforts. And principals must initiate these activities if they are to have any hope of affecting entire schools.

Finally, principals can use their influence to ensure that quality inservice programs are provided for teachers. Coaching programs must have some content to coach, and the greater the expertise brought to bear on identified problems, the greater the dividends from a coaching effort.

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APPENDIX A

The Coaching of Teaching

Training Manual

for

Peer Coaches

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FORWARD

The purpose of this manual is to help you assist other teachers as they attempt to integrate into their teaching repertoires new teaching strategies with which you are already familiar. In many ways your work with other teachers will be collaborative as you both grapple with technical (skill) difficulties and appropriate uses for new teaching strategies. On the other hand, your greater experience with the strategies in your own classrooms will place you in a position to assist others as they attempt to cope with many of the problems you have already encountered. This manual includes a definition of and rationale for the coaching of teaching, reports the types of assistance which many of you found helpful in your initial trials with new teaching models, and provides examples of the types of problems teachers may encounter in their beginning attempts.

Finally, this manual is a work in progress. As we work together this year to discover how we might better help ourselves and each other through the problems of transfer of training, we will refine and add to the ideas in this paper.

Why "Coaching?" **

In previous reviews (Joyce and Showers, 1980, 1981) we have accumulated reports of research about the effects of each of these components on the development of skill in the use of an approach to teaching that is new to the teachers studying it and on transfer of the approach into the active teaching repertoire. The study of theory, the observation of demonstrations, and practice with feedback, taken together (provided they are of high quality), are sufficient to enable most teachers (nearly all in fact) to develop skill to the point where they can, when called on to do so, use the model fluidly and appropriately. However, the development of skill by itself does not ensure transfer and relatively few persons, having obtained skill in new approaches to teaching, will then transfer that skill into their active repertoire and use the new approaches regularly and sensibly unless additional instruction is received.*

However, when the coaching component is added into the equation and implemented effectively, then most (probably nearly all) teachers will begin to transfer their new (for them) model into their active repertoire.

While the major portion of this paper will be devoted to the coaching process we want to emphasize that the other components are extremely important if skill is to be obtained. Unless people develop skill in a new approach, they have no chance whatsoever of adding it to their repertoire. Coaching without the study of theory, the observation of demonstrations, and opportunities for practice with feedback will, in fact, accomplish very little.

* Transfer of new items of repertoire is more difficult than the transfer of skills that polish or "fine tune" models of teaching that lie within the existing repertoire.

**Pages 1-14 were taken from "The Coaching of Teaching," Educational Leadership, 1982, 40, 4-10.

Also, it should not be inferred from our description that the components occur in a strict sequence or need to be separated from one another. One might begin the route to mastery of a new approach to teaching by observing a few demonstrations of it, then turn to the examination of its theoretical rationale, observe more demonstrations, begin to practice with frequent excursions back to theory and further observation and then, during the stages of transfer receive coaching but continue to attend training sessions where the study of theory, demonstrations, and opportunities for practice and feedback are used. However, coaching <u>is</u> a major element in our attack on the transfer problem and it is in the context of its place in accomplishing transfer that we conceive of it.

For most of us, the attainment of skill is not a sufficient condition to bring about transfer of that skill into the workplace. The same phenomenon occurs in training in other professions. Nearly all of the training of complex skills in military and industrial applications assumes that skill development will not by itself bring about transfer, so designers of training provide conditions which are contrived to attack the transfer problem, that is, to facilitate the utilization of skills. We believe that the "problem" of transfer is really a definition of a new stage of learning which becomes a problem only if it is not recognized. Essentially, in our case, once a teaching skill has been obtained it needs to be transformed during the process when it is transferred into the active repertoire. The conditions of the classroom are sufficiently different from training situations that one cannot simply walk from the training session into the classroom with the skill completely ready for use--it has to be

changed to fit classroom conditions. Also, the appropriate use of the skill in its context requires that an understanding of the students, subject matter, the objectives to be achieved, and the dimensions of classroom management all be under "executive" control, that is, clearly understood so that skill can be used appropriately and forcefully. In addition, all of us are less skillful with a model of teaching that is new to us than we are with the ones that we have been using for some time. Successful transfer requires a period of labor through which the skill is practiced in its context until it is tuned to the same level of fluidity as elements of the previously existing repertoire. To confound things somewhat further, sets of teaching behaviors which surround and make the existing repertoire function well may actually be dysfunctional to new models of teaching as they are added to the storehouse of skills. We can see this when a teacher who is accustomed to running brisk and pointed "drill and practice" sessions begins to learn how to work inductively with students. The swift pace of the drill and practice, the directive feedback to the students, and the ability to control the content and movement of the lesson are at first somewhat dysfunctional as the teacher moves to a relatively more "laid back" stance, relies more on initiative from the students, probes their understanding and helps them learn to give one another feedback. The new teaching strategy seems awkward. Its pace seems slow. The teaching moves which served so well before now appear to retard the progress of the new kind of lesson. After a while, practice in context smooths off those rough edges and the new strategy gradually comes to feel as comfortable and "in control" as the old one did.

In summary, there are quite a number of elements of new learning

involved in this transfer process. To achieve these kinds of learning in such a way that they will effectively attack the transfer problem (or, really, prevent it from being a problem) three techniques are available in addition to coaching. These are:

- to forecast the transfer process throughout the training cycle;
- to reach the highest possible level of skill development during training;
- to develop what we term "executive control" that is, an understanding of the appropriate content for the model and how to adapt it to students of varying characteristics--a "meta understanding" about how the model works, how it can be fitted into the instructional repertoire, and how it can be adapted to students.

The forecasting of the process of transfer is extremely important. Teachers need to understand that they cannot simply walk away from a training session and have no difficulty thereafter. It is not uncommon for teachers who have attended even relatively weak training sessions and then tried to apply the product in their own teaching to report, "Well, that doesn't work." Of course it doesn't work. If the treatment were weak the product will never work, but even with the strongest training, there will be a period of discomfort when any genuinely new skill is being used. Even very experienced and capable teachers should be aware throughout the training process that they are going to have to gear themselves up for a second stage of learning that will come after skill has been developed.

Skill development, of course, is really essential. Most preservice and inservice teacher training has used incredibly weak training. When

we think of a model of teaching of average difficulty, we assume that the study of theory will have to occupy as much as twenty or thirty hours (complex models require much more than that). At least fifteen or twenty demonstrations should be observed of the model being used both with various kinds of learners of various characteristics and also in several content areas. Demonstrations also need to be included when teachers are trying the model for the first time, when they are introducing students to the model, and when they are trying to learn how to teach it to them. Third, the attainment of competence requires quite a number of practice sessions. Each teacher needs to try the model with peers and small groups of students from ten to fifteen times before a high level of skill begins to be produced. If the transfer process has been forecast it makes good sense to teachers to want to build the highest level of skill they can before using the model in the more complex context of the classroom.

The development of executive control has not been a common concept in training. Essentially it involves the understanding of an approach to teaching, why it works, how it works, what it is good for, what its major elements are, how to adapt it to varying kinds of content and students--the development of the set of principles that enable one to think about the approach and to modulate and transform it in the course of its use. Executive principles should be included in training content.

The forecasting of transfer, the highest level of skill, and the development of executive control increase the odds that a successful transfer can take place and, together, they set the state for coaching.

The Process of Coaching

Ideally "coaching teams" are developed during the training process. If we had our way, all school faculties would be divided into coaching teams, that is, teams who regularly observe one another's teaching and provide helpful information, feedback, and so forth. In short, we recommend the development of a "coaching environment" in which all personnel see themselves as one another's coaches. But, in the present context, the primary function of coaching is to assist the acquisition of new elements of repertoire. Thus most of the illustrations which will be given here will be of teachers organized into coaching teams much like the Lazarus faculty described in the scenario above.

However, what does the process of coaching actually involve? We see its major functions as ones of:

- the provision of companionship
- the giving of technical feedback
- the analysis of application: extending executive control
- adaptation to the students
- personal facilitation.

The Provision of Companionship

Its first function is to provide interchange with another human being over a difficult process. The coaching relationship results in the possiblility of mutual reflection, the checking of perceptions, the sharing of frustrations and success, and the informal thinking-through of mutual problems. Two people, watching each other try a new model of teaching for the first time, will find much to talk about. Companionship provides

reassurance that problems are normal. Both persons find that their habitual and automatic teaching patterns create awkwardness when they practice the new procedures. Concentrating on unfamiliar moves and ideas, they forget essential little odds and ends. The companionship not only makes the training process technically easier but it makes the quality of the experience better. It is a lot more pleasurable to share a new thing than to do it in isolation. The lonely business of teaching has sorely lacked the companionship that we envision for our coaching teams.

The Provision of Technical Feedback

In the course of training our team members learn to provide feedback to one another as they practice their new model of teaching. They point out omissions, examine how materials are arranged, check to see whether all the parts of the teaching strategy have been brought together, and so on. "Technical" feedback helps ensure that growth continues through practice in the classroom. The pressures of the context tend to diffuse the teaching experience and draw attention away from the new teaching strategy. The provision of technical feedback helps keep the mind of the teacher on the business of perfecting skills, polishing them, and working through problem areas.

Nearly any teacher who has been through a training process can learn to provide technical feedback to another teacher.*

The act of providing feedback is also beneficial to the person doing it. The coaching partner has the privilege of seeing a number of trials of the new model by another skilled teacher. It is often easier to see

* Technical feedback should not be confused with general evaluation. Feedback implies no judgment about the overall quality of teaching but is confined to information about the execution of model-relevant skills.

problems of confusion and omission when watching someone else teach than when attempting to recapture one's own process. Also, ideas about how to use the model are collected through observation. When a group of four or six teachers observe each other regularly while they are trying out a model, they can not only give technical feedback to each other, but will received it vicariously while they are observing it being given. Also, among them, they will produce a number of fine practices which constitute further demonstrations and from which they can obtain ideas for the use of the model.

Analysis of Application: Extending Executive Control

One of the most important learnings from the transfer period is figuring out when to use a new model appropriately and what will be achieved as a consequence. Selecting the occasions for the use of a teaching strategy is not as easy as it sounds. Nearly everyone needs assistance in learning to pick the right spots for exercising it. Also, unfamiliar teaching processes appear to have less certain outcomes than do the familiar ones. From the early trials one often has the impression that one has "worked all day and not gotten very far." Most of us need assistance in finding out how much we have, in fact, accomplished and also, of course, how we might accomplish more by making adjustments in the way we are using the model. During training the coaching teams need to spend a considerable amount of time examining curriculum materials and plans and practicing the application of the model that they will be using later. Then, as the process of transfer begins, practice in the classroom intensifies. Closer and closer attention to appropriate use needs to occur.

Adaptation to the Students

As mentioned earlier, much of the energy expended in learning to use a new model of teaching is consumed in the process of learning how to teach it to the children. Successful teaching requires successful student response. Teachers are familiar with the task of teaching the students how to engage in the instructional processes that are most common. A model which is new to a group of students will cause them trouble. They will need to learn new skills and to become acquainted with what is expected of them, how to fulfill the task demands of the new method, and how to gauge their own progress. In addition, the model of teaching needs to be adapted to fit the nature of the group of students. More training must be provided for some, more structure for others, and so on. In the early stages adaptation to the students is a relatively difficult process requiring much direct assistance and need for companionship.

One of the major functions of the coach is to help "players" to "read" the responses of the students to make decisions about skill training that is needed and how to adapt the model. This is especially important in the early stages of practice when one has one's hands full with the management of one's own behavior and it is more difficult to worry about the students than it will be later on.

Facilitation

As we have intimated earlier one of the most uncomfortable aspects of practicing any new approach to teaching is that one is almost surely less competent with it than with the approaches in one's existing repertoire.

When trying a new model of teaching nearly all of us feel bad about ourselves as we fumble around. The students sense our uncertainty and let us know in subtle and unsubtle ways they are aware that we are less certain and sure-footed than usual. At such times we tend to become discouraged relatively easily. The expression "I tried that method and it didn't work" refers as much to the sense of dismay that accompanies the early trials as it does to the actual success or failure of the method itself. The fact is that successful use of a new method requires practice. The early trials just aren't perfect, or even close to our normal standard of adequacy. Thus one of the major jobs of the coaching team is to help its members feel good about themselves as the early trials take place. A real tragedy in the context of teaching is that there is so little interpersonal support and close contact with other teachers because classrooms are such terribly isolated places. Coaching reduces the isolation and increases support.

The question is often asked, who should coach? We're really not sure about that. On a practical basis most coaching should be engaged in by teams of teachers working together to study new approaches to teaching and to polish their existing teaching skills. There is no reason why administrators or curriculum supervisors or college professors cannot be effective coaches also. But from a purely logistical point of view teachers are closer to one another and are in an excellent position to carry out most of the coaching function.

Parallels with Athletic Training

We are beginning to discover parallels between the problem of transfer

in teaching and the problem of transfer in athletic skills.

> There are going to be so many things in your head that your muscles just aren't going to respond like they should for awhile. . . .You've got to understand that the best way to get through this is to relax, not worry about your mistakes and come to each practice and each meeting anxious to learn. We'll generally make you worse before we make you better.
>
> Coach Rich Brooks of the University of Oregon to his incoming freshman football players, Friday, August 14, 1981, The Eugene Register-Guard

Coach Brooks' recent admonition to his freshmen highlighted the parallels for us. Intrigued by the obvious parallel between his players and our teachers, we approached Coach Brooks and asked him to talk with us about training and the problems of transfer. The resulting interview revealed striking similarities in the training problems faced by teachers, football players, and their coaches.

Q. Coach Brooks, I'm interested in how you approach skill development in football training and if you consider the transfer of those skills to game conditions to be a separate training problem.

A. Although our players come to us with skills, we reteach and refine those skills as though we were starting from scratch. We teach them our way of doing it, because all those skills have to fit together into one team, they're all interdependent.

Q. Could you tell me your approach to skill development?

A. We use a part/whole/part method. All skills are broken down into discrete steps. We work on each segment, then combine them into whole skills, then into plays, etc., then go back and work on the specifics of skills that are giving problems.

Q. Could you give me an example of a specific skill and how you would approach the training for that skill?

A. The fundamentals of blocking and tackling--bending the knees and striking a blow. All positions need this skill. The trick is to get the player to visualize, to have a mental picture of how it looks and how it feels. Otherwise, feedback isn't effective. We can tell them where it's wrong but they can't correct it till they know.

Q. How do you get them "to know" what the skill is?

A. We tell them, show them, demonstrate with people and with film, show them films of themselves, have them practice with the _____.

Q. The what?

A. It's a mechanical dummy they practice with. We have them practice each move separately, then put the moves together, first one, then two, then three--how their knees should be bent, where their arms should come up, where they strike, what all the muscles should be doing. We diagnose problems with the dummy and keep explaining how it should work, over and over again, in sequence.

Q. In teacher training, we believe that theoretical understanding is important for later performance. How important is it in football skills?

A. It's essential—they must understand how their bodies work, why certain muscle groups in certain combinations achieve certain effects. We never stop explaining.

Q. After they have mastered blocking to your satisfaction with the dummy, then what?

A. Moving from the machine to a live test is difficult; moving from practice to a game is also very difficult. Some people have all the physical ability in the world, all the moves, but can't play because they can't grasp the entire concept, can't fit in with the whole picture.

Q. We have problems with transfer of training too. Do you coach them differently after they've mastered the "basic skills" of football? What will you be doing differently next month after the season has started? How do you work on transfer?

A. Fear of failure is a factor. My job is to create confidence and success situations. Skills have to be overlearned so that they're past conscious thinking. I can't have someone thinking of how to throw a block in a game. They have to be thinking of who and when and what the guy on their left or behind them is doing.

Q. So specifically, how do you coach for transfer of skills to a game situation?

A. First, we re-emphasize skill training for everyone. The second, third, fourth year guys as well--we're always working for improved execution. Then we work hardest on integration, which is just a new kind of teaching. Coaching is really just teaching. We work on confidence by putting them in situations where they can see the improvement. If a guy was lifting 300 pounds two weeks ago and is lifting 350 now, no one has to tell him he's getting stronger.

Q. How does the training break down for your players right now, before school starts?

A. We spend three hours in the classroom and two hours on the field. On their own they spend a couple of hours in the weight room and working out, and another couple of hours with the trainers, working out their bumps and bruises.

Q. And after school starts?

A. We'll spend 45 minutes a day in class, two hours on the practice field plus whatever they can manage on their own, after studies.

Q. How does that differ from pro football players' training regimen?

A. They meet two-three hours daily in position meetings, offensive and defensive meetings, watching films of themselves and their opponents, then practice two to four hours a day, depending on their coaches, then their personal work and time with the trainers. They have more time to get into the complexities of the game.

Changing what we do, even slightly, can unbalance the rest of our "game." Whether switching from quarterback to tight end, adjusting the grip on a golf club, or initiating an inquiry procedure for science teaching, the new skill does not fit smoothly with existing practice. The fact that the new skill may have been perfected in parts and practiced thoroughly in simulated conditions does not prevent the transfer problem. Surrounding behaviors must adjust to the presence of a different approach, and the discomfort of this new awkwardness is often enough to ensure a return to the former smooth, if less efficient, performance.

Perhaps the most striking difference in training experienced by athletes and teachers is the initial assumptions held by each. Athletes do not believe mastery will be achieved quickly or easily. They understand that enormous effort will result in small (and not always linear) increments of change. We, on the other hand, have often behaved as though teaching skills were so easily acquired that a simple presentation, one-day workshop, or single videotaped demonstration were sufficient to ensure successful classroom performance. To the extent that we have communicated this message to teachers, we have probably misled them. Learning to use an inductive strategy for the learning of concepts is probably at least as difficult as learning to throw a block properly.

Coach Brooks' description parallels the argument we have tried to make. The task of learning new skills and integrating them, not only as an individual performer but as an entire team, the knowledge that "we'll generally make you worse before we make you better," and the importance of continuing to try when results are discouraging eloquently forecast the transfer process. The necessity of overlearning skills to the point of automaticity if they are to be useful in a more complex setting is reflected in his training regimen. "Executive control" is sought in the frequent and on-going emphasis on theory and the classroom work on "plays," "game plans," and analysis of films.

The elements of coaching in teaching--the provision of companionship and technical feedback, study of application, study of students (or opposing teams) and personal facilitation--are also clear in the interview with Coach Brooks. Football players however, have a built-in advantage when implementing this process--their training is organized as a group activity with continuous feedback from coaches. We came away from this interview feeling more strongly than ever that teachers must also organize themselves into groups for the express purpose of training themselves and each other and to facilitate the transition from skill development to transfer.

Coaching Conferences

The purpose of the coaching conferences is to provide support and encouragement for teachers as they attempt new and often awkward teaching strategies in the context of their usual curriculum; to think with teachers about appropriate uses of the new models of teaching, given their instructional objectives; and, when necessary, to help teachers plan lessons using the new strategies with their own materials. Rarely, however, do all these elements of coaching occur in a single conference. The following discussion reflects the most common emphases that emerged during coaching conferences in a recent study.

Early conferences* are generally devoted to the education of the coach. Teachers are asked to share information about what, who, and how they teach. The coach needs to understand the teacher's work conditions, e.g., if he/she instructs one or many grade levels and ability groups and one or more subjects. Does the teacher prefer one teaching strategy in which he/she is expert or does she/he use a variety of teaching models on a regular basis? What does the teacher see as the major concepts in their subject area for which students will be held responsible? Are there specific skills or behaviors that students must physically demonstrate? How does the teacher measure the various student outcomes toward which they are striving (e.g., standardized tests, teacher-made tests or a combination of the two, judgements or ratings of products, such as a painting, cake, bookshelf, etc., scoring of a dive)?

As a coach, you often will be working with teachers in many different subject areas. Thus it is critical that you understand what the teacher is trying to accomplish and how and with whom, if you are to be of any assistance to that teacher. It is not the coaches' job to impose a new agenda

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*We will practice initial conferences using the forms and role descriptions in the appendix.

on the teachers with whom they work. On the other hand, once you understand the teacher's objectives, you will often be in a position to clarify links between new strategies and instructional aims. The experiences you will have as a result of observing in multiple classrooms plus weekly sessions with other peer coaches will add to your own store of experiences many ideas for uses of teaching strategies.

Unfortunately, teachers are seldom asked the kinds of questions you will be asking them in these early conferences; they may be rusty in articulating the central concepts in their subject area or the kinds of teaching strategies they employ. Objectives may sometimes be very general, e.g., in response to the question "What do you want to accomplish with your students in the next few weeks or months?", teachers may answer

-basic skills

-maps

-writing

-comprehension

or they may be extremely specific, e.g.,

-capitalization

-[illegible]verbs

-map words

-graphing.

It will be easier to match teaching strategies to objectives which fall between these extremes, although the other kinds of information are valuable. To better understand intermediate objectives, you may find it helpful to probe teachers, as in the following sample dialogs:

Coach: What sorts of learning objectives do you have for your students during the next few weeks?

Teacher: Writing.

Coach: Will you be working on any specific kind of writing, such as descriptive paragraphs or essays, poems, short stories, editorials, etc.?

Teacher: We'll start with sentence combining, then paragraphs, then descriptive essays.

Or . . .

Coach: What do you want to accomplish with your students in the next few weeks?

Teacher: Comprehension.

Coach: What sorts of things will your students be reading in this class?

Teacher: We'll be reading plays in this next unit.

Coach: How do you plan to approach the comprehension task with this material?

Teacher: Well, first, we'll work on some concepts they'll need for several of these plays, like 'satire', characterization', 'euphemism'. We'll have to develop some vocabulary and understandings before I can really look at their comprehension.

Once you understand the circumstances surrounding the teacher's present assignment and what their present objectives are, subsequent coaching conferences develop in several ways. Occassionally teachers want to concentrate first on their technical competence with a given strategy or strategies. Others may first want to focus on student responses to new teaching strategies and still others may be most concerned with the fit of strategies to objectives. Finally, teachers will vary widely in the anxiety they experience as they experiment with new teaching behaviors and in their need and desire for support and encouragement. Although the elements of coaching may be used with every teacher, the configuration of those elements will be unique for each individual.

Technical Feedback

Our previous experience with the coaching of teaching suggests that teachers at some point will need assistance with the technical aspects of new strategies. While teachers will vary widely in their need for technical feedback, most will want clarification at some point on the skill components of various models of teaching.

Using the clinical assessment forms as you observe lessons in classrooms will help you identify technical misunderstandings and skill deficiencies. In addition, each model seems to require certain behaviors that many people find difficult, and we will focus on these aspects in our training sessions. For example, in Concept Attainment, the first and most important task for the teacher is identification of a concept in their subject areas. Obvious as this may appear on the surface, you will almost surely have to help some teachers with this task. If possible, review teacher's lesson plans with them before they teach a lesson. It is very discouraging for a teacher to receive feedback after a lesson that his/her difficulties stemmed from the absence of a concept or for the teacher to discover midway through the lesson that "there's something wrong" with their concept. It is helpful, when previewing lesson plans with your teachers, to apply some quick checks on the nature of their concepts.

- Is the concept a name for a class of objects?
  ("Fruit" is the name for a class of objects which can include apples, oranges, grapes, etc. "France" is not the name of a class of objects but rather an example of a concept like "country".)
- For your concept, can you list attributes which are common across all the yes examples?
  (Attributes of "fruit" include seed-bearing, product of plant growth,

a sweet pulp enclosed in skins, etc. It is not possible to generate attributes of "France" although students might be able to describe France, e.g., "it's on the Atlantic ocean and the Mediterranean sea, shares borders with Italy, Switzerland, Belgium, etc.. The latter, however, are not attributes of a concept.

If the "concept" chosen by a teacher appears to be exceedingly complex, you may check to see if it is a generalization. Generalizations usually represent a relationship among several concepts, e.g., Prices are determined by supply and demand. The three concepts related in this generalization are prices, supply and demand.

It may be useful for teachers to construct hierarchies of concepts for their subject area. Concepts may range from quite specific to very broad, and a schematic outline often clarifies the interrelationships of concepts within a discipline. The following example, taken from Clinton E. Boutwell's Getting It All Together, illustrates hierarchical concepts in anthropology.

I. Culture	II. Culture Type	III. secular
		urban
	Culture Change	monastic
		preliterate
		diffusion
	Belief Systems	assimilation
		migration
	Organizations	adaptation
		mores
		myths
	Art	values

Of course, all the teachers with whom you will be working will have

had some practice in identifying concepts within their subject area. Nevertheless, concept identification has proved to be a continuing difficulty for many teachers and you will need to be prepared to assist teachers with this task.

A second task many teachers find difficult in their early trials with concept attainment is providing an appropriate focus for students as they begin to examine the data presented. Unless the data are truly unidimensional, some focus should be provided students as they study both the positive and negative exemplars for a given concept. A focus statement should identify relevant aspects of the data as well as irrelevant aspects (e.g., Do look at the way the author describes characters and the way he uses language to introduce us to them. Do not focus on dialects, grammar, or punctuation; they are not important for this concept). When framing a focus statement, it is often useful to first restate the concept, then move one level of abstraction above the concept to provide a focus.

Finally, teachers may ask you to explain the importance of Phase III in the Concept Attainment model of teaching. Many will prefer to omit the "analysis of thinking" section of this model, feeling they have accomplished their objectives when students can generate attributes of a concept, name it, correctly classify unlabeled examples and generate additional examples of a concept. When you review the rationale for Phase III (e.g., making thinking strategies conscious for students, providing multiple examples of different thinking strategies used by various students, facilitating independence in students when they are confronted with unclassified data in the world around them, etc.), try to get a commitment from the teacher to try it once when you are observing. This will give you insights into possible technical difficulties the teacher is experiencing with Phase III as well as build the teacher's understanding about pupil's thinking strategies.

Classroom Management and New Teaching Strategies

Classroom routines develop to increase efficiency and comfort for both teachers and students in the performance of instructional tasks. They increase efficiency by reducing the time required to explain procedures and structure activities, thus making more time available for active engagement with learning tasks, and they increase comfort by minimizing surprises and the need constantly to adapt to new situations and demands. Routines, can, of course, become counterproductive when extended to every detail of school life. When no opportunities exist for choices in either classroons, subject areas or social life, students and teacher can find their joint educational enterprise stifling and boring. Schools recognize this danger and generally attempt to provide choice and variety within a larger routinized and scheduled existence. Most of us, however, would find our work lives unnecessarily complex without some established routines.

The introduction of new teaching strategies into existing instructional patterns often causes some dislocation of routines, and will probably become a topic in your coaching conferences. Teachers who have introduced these strategies into their instructional repertoires have varied considerably in their perceptions of the resulting dislocations in routines. Relative comfort or discomfort with behaviors required by teachers and students as they use their recently acquired strategies appears to rely on several variables: the range of existing instructional repertoire, general instructional management skill, and attitudes and beliefs held toward incorporating change.

Teachers who regularly employ a variety of teaching strategies find virtually no problems in introducing additional models of teaching

into their classroom practice. Not only are they and their students more likely to possess some of the skills or behaviors inherent in the new strategies, their comfort with variety makes the process learning required by the strategies interesting and inherently valuable.

On the other hand, teachers who have typically employed one or two instructional strategies may find the addition of new models of teaching more difficult. Their skills and those of their students may be narrowly developed and accompanied by beliefs that there is one right, best, most efficient way to teach. In a previous project, teachers who experienced dislocation in routines and management practices reported student complaints about the new strategies as well, whereas teachers comfortable with the temporary (as they perceived them) rough spots engendered by the introduction of change in the classroom never reported student complaints. It is possible, of course, that teachers enthusiastic about the new models of teaching forgot or failed to hear or heed student discomfort, while teachers already uncomfortable with demands for new behaviors on their parts may have exaggerated student discontent. Our classroom observations, however, tend to corroborate teachers reports of their students' responses to new models of teaching.

Teachers with poor classroom management skills will almost surely continue to experience problems with the new teaching strategies. If their students normally do not listen to directions, participate in class discussions, or complete assignemnts, introducinc a new strategies is unlikely to change that. Inevitably, questions of classroom management, quite separate from the skills and behaviors indicated by a specific model of teaching, will arise in the coaching conferences.

A good rule of thumb to follow in conferences when classroom management becomes the focus of conversation is to follow the teacher's lead. Elicit information from the teaching regarding his/her perception

of the impact, of any, of the teaching strategy upon student behavior. Then ask the teacher what he/she normally requires/expects of students behaviorally and what percentage of time they feel students are generally on task and following set procedures. Teachers vary quite markedly in their expectations and tolerance for student behavior. Since I have been in all your classrooms, I know that none of you experience serious management problems and that you have strategies for coping with occassional unacceptable student behavior. Frequent classroom observations of other teachers may reveal to you teacher-student interactions you find shocking, either because they are (by your standards) excessively structured or excessively chaotic. I will just reiterate that the topic of classroom management can be a sensitive area and suggest you not initiate such discussions in order to give advice. On the other hand, when teachers initiate the topic, you will be in an excellent position to help. All of you have good management strategies to share and are non-punitive, you are currently practicing teachers and so not vunerable to charges that you knowledge is unrealistic and untested.

Comments specific to the models your colleagues will be practicing are presented below and will provide us settings for our role-playing of conferences.

1) "Kids get excited, all talk at once."

In Taba and Synectics, students are asked to generate data or examples of analogies. Classroom rules regarding sequential speaking, taking turns, waiting for permission, etc. sometimes get ignored. How will you respond to a teacher who voices this concern?

2) "I can't be sure they'll come up with what I want."

In Taba and Synectics, later discussion depends on earlier student responses. During the concept formation phase of Taba, students generate,

group and label data around a topic the teacher has selected, and in Synectics, compressed conflicts depend on words/analogies generated by students in the early phases of the model. Some teachers feel uncomfortable with their inability to control the products of these models. How will you respond to a teacher who voices this concern?

3) "When they are finished, I have no concrete evidence of what they have learned."

In Concept Attainment, and phases of Taba and Synectics, the emphasis is on verbal reasoning and problem solving. While the teacher has a unique opportunity to observe students' thinking during these models, the emphasis on discussion reduces the number of worksheets common to many classrooms. How will you respond to a teacher uncomfortable with such changes in their evaluation practices?

4) "The students see this activity as a game."

While you may perceive the above comment as a plus for any given strategy, some teachers see it as a negative consequence of the models. While they appreciate the student enthusiasm and involvement often precipitated by the models, they worry that students are not sufficiently serious about learning. How would you respond to a teacher who expressed this concern?

In summary, many teachers will express positive feelings about the changes in classroom routines and student behavior that result from the use of new teaching strategies. For these teachers comments about classroom management will be confined to their observations of differences from established norms, and as such will be the source of interest or delight. Other teachers may need help working out the logistics of handling whole-class discussions or small-group work, but will matter-of-factly ask you for suggestions or examples of how you have handled similar organizational problems. Finally, teachers who are uncomfortable with the changes required of them by the new models

may be defensive about your observations and discussions about the sources of their discomfort.

Unfortunately, there is no simple formula for working with this latter group. However, useful procedures may include:

1) Eliciting information from the teacher regarding his/her expectations, norms
2) Acceptance of those norms and willingness to work within them
3) Provision of examples other have tried and found successful
4) Support for teachers when they are willing to experiment with new teaching behaviors.

Providing Support

Earlier we discussed the difficulty of integrating new behaviors into existing teaching patterns. You have already discovered the role of practice in building skill and comfort with new strategies. In fact, because you often teach several sections of the same course, you hav shared with me the utility of doing the same lesson with successive classes until the new strategy is "de-bugged" in much the same way a computer programmer perfects a new program.

The greatest problem with the discomfort generated by early awkwardness is a tendency by many people to discard the new behavior. Teachers who generally experience no technical difficulties with the teaching methods they have mastered sometimes forget that those methods were once awkward as well. They conclude that the new strategies are ineffective and inefficient. Providing encouragement and feedback to teachers in the early stages of implementing new models of teaching is often crucial if teachers are to gain sufficient practice with the models to master them.

Teachers vary widely in their need for support and encouragement as they attempt to integrate new teaching behaviors into their existing repertoires. As a coach, it is wise to respond to teacher cues in providing support. If teachers express anxiety, disappointment and/or frustration with the process, the coach responds with reassurance, encouragement, suggestions, and offers of help (e.g., joint teaching of a lesson, locating additional materials, etc.). This does not mean, however, that you should give inaccurate feedback. If a teacher produces a disaster, your telling him/her it was not really a disaster will not only not make them feel better, it will make you appear unreliable and insincere. In our role plays of these situations, we will focus on the communication skills already studied (e.g., direct communication, active listening, etc.).

For some teachers, the question of support will never arise. These teachers approach the coaching conferences in a comfortable, matter-of-fact way, evaluating their own performance and that of their students, and then proceed directly to plans for future lessons. They neither seek nor expect much support from the coach. With these teachers, it is important to remember that everyone values accurate feedback on their performance, and this feedback functions as support for teachers who appear not to need praise and encouragement for their efforts. Superbly planned and executed lessons should be noted, including specific descriptions of why they are exceptional. Well integrated lessons should be highlighted to be certain that teachers are conscious of what they have achieved, and particularly well conceived and prepared materials deserve comment as well.

Fitting Instructional Strategies with Educational Objectives

Last year one of the greatest barriers to transfer of new strategies to teaching practice was the inability to perceive applications for the models in the context of an established curriculum. As you assist people with this task, you will need repeatedly to ask teachers for clarification of their educational aims in order to provide useful suggestions. I found this activity the most challenging aspect of coaching, as one must continually practice role taking to understand another's point of view and stretch oneself intellectually to think of applications that are appropriate for an instructional model while not violating the spirit of a course.

The following examples illustrate with two teachers the progression of fitting strategies with curriculum and objectives.

1) Teacher A. Teacher A taught 7th and 8th grade language arts in a middle school setting. When asked his objectives for students during an 8-week period, he focussed on writing skills, particularly essay and descriptive writing. Early trials with Concept Attainment centered on structural aspects of English (parts of speech, double negatives, types of phrases and clauses). While these lessons represented "fair" uses of Concept Attainment, they hardly advanced the teacher's stated goals. We suggested he leave Concept Attainment temporarily and try applying Synectics directly to a descriptive writing problem. After exploring the potential for developing rich characterizations through compressed-conflict analogies--with rather exciting results--the teacher returned to Concept Attainment to develop clearly in the minds of his students the characteristics or attributes of various writing styles. Although we helped with suggestions of lessons that would fit specific strategies and were consistent with his objectives, his clarity about what he wished to accomplish made the process easy and mutually enjoyable.

2) Teacher B. Teacher B taught 7th and 8th grade social studies

in a middle school setting. When asked his objectives for students during an 8-week period, he replied "maps". Whereas Teacher A could provide extensive detail when questioned regarding the specifics of his objectives, Teacher B had difficulty articulating anything beyond "maps". In this situation, the coach has the much more difficult and delicate task of helping a teacher define learning objectives for students that he/she may not previously have considered. Teacher B was willing to entertain alternative approaches to the study of "maps" but sometimes failed to understand how these approaches might be implemented. The coach eventually read his text, defined concepts associated with map study which would be appropriate for the Concept Attainment strategy, identified regional cultural characteristics for sections of the globe (e.g., religions, political systems of the Middle East), and assisted in the planning of a Taba lesson which examined effects of religion on life styles in large sections of the world. Teacher B required help with gathering up a management system for student collection and organization of data.

Objectives observers of Teacher B would have seen enormous differences between his baseline and treatment teaching strategies. However, the coach was not successful in creating the independent ability of Teacher B to conceive of such lessons by himself. We will spend considerable time, both in our training sessions and later in our weekly staff meetings, discussing approaches to similar problems.

QUESTIONNAIRE

Peer Coaches - 1983

Name_____ School_____

Present Teaching Assignment _____

_____

Years Teaching Experience_____ Highest Degree_____

Certification_____

Professional Goals_____

_____

_____

Previous Experience in Providing Inservice Education_____

_____

_____

_____

Previous Experience in Supervision_____

_____

_____

_____

_____

Do you have any misgivings about being a peer coach?_____ If yes, please elaborate.

_____

_____

_____

What skills do you personally hope to develop or polish in this course (e.g., interpersonal communication skills, observation and feedback skills, etc.)?

_____

_____

GUIDE FOR INITIAL COACHING CONFERENCE

The following guide will help you gather information needed for later conferences and organize your notes from initial conferences. You may, of course, collect additional data as well but I would like for all of us to have this information in common.

1. What do you teach? (subjects, age levels, ability levels)

(Note the class [subject, time etc.] we will be observing for this teacher.)

2. How do you teach this class? What teaching strategy or strategies do you most frequently use?

3. What are the major concepts you want your students to master in this class?

4. How do you measure students' mastery of these concepts?

5. Have you thought of ways the new strategies you have learned might be used to teach this class? _____(if yes, ask for details; if no, ask if you can think with them about possible uses.)

Role descriptions for teachers being interviewed by their "coaches":

Teacher #1: Mary Beth

Mary Beth recently took a class on teaching strategies because she needed three units to renew her credential and the credit was free. She thought the teaching strategies were wierd, not to mention difficult, and had'nt really planned to use them ever again. Now a "coach" is asking her to explain her future use of the strategies and wants to see them. Mary Beth is nervous about having another adult in her class; she's had tenure for years and her principal quit visiting her room a long time ago. Her attitude toward this new development is best described as passive aggressive; social and professional norms make it "uncool" to say the whole idea is ridiculous but she'll get out of it if she can.

Teacher #2: George

George recently took a class on teaching strategies because his principal thought it might be a good idea for him to take a class after all these years. He thought the class was a barrel of fun, although he never put a lot of energy into doing the assignments. Now his "coach" is asking him to explain his future use of the strategies and the coach wants to observe him using them in his classroom. George likes the coach and really doesn't mind being observed, but he's at a loss for how he might use the strategies to teach social studies. He volunteered to do a lesson on animals that one of the other teachers did during the class, but the coach really wants him to try something in social studies.

Teacher #3: Sue

Sue recently took a class on teaching strategies because she read an advertisement about the course and thought it sounded interesting. During the course, she worked hard on mastering the new strategies, although she reserved judgment about their utility until she had tried them with her students. Sue is frankly enthusiastic about the strategies now and is pleased to have a "coach" to work with as she continues her study. Sue has lots of ideas about how she might use these strategies and is eager for more.

TEACHING ANALYSIS GUIDE FOR CONCEPT ATTAINMENT

PHASE 1: Presentation of Data and Identification of the Concept

1. Did the teacher state the purpose of the game?	Thoroughly	Partially	Missing	Not Needed
2. Did the teacher explain the procedures of the game (how the "yeses" and "noes" function)?	Thoroughly	Partially	Missing	Not Needed
3. Did the initial "yes" clearly contain the essential attributes?	Thoroughly	Partially	Missing	Not Needed
4. If teaching a conjunctive concept, did the teacher begin with a "yes" exemplar?	Thoroughly	Partially	Missing	Not Needed
or				
If teaching a disjunctive concept, did the teacher begin with a "no" exemplar followed by a "yes"?	Thoroughly	Partially	Missing	Not Needed
5. Did the teacher ask questions that focused students' thinking on the essential attributes?	Thoroughly	Partially	Missing	Not Needed
6. Did the teacher ask the students to compare the "yes" exemplars?	Thoroughly	Partially	Missing	Not Needed
7. Did the teacher ask the students to contrast the attributes of the "yes" exemplars with those of the "no" exemplars?	Thoroughly	Partially	Missing	Not Needed
8. Did the teacher present labeled exemplars?	Thoroughly	Partially	Missing	Not Needed
9. Did the teacher ask the students to generate and test hypotheses about the identity of the concept?	Thoroughly	Partially	Missing	Not Needed
10. Did the teacher ask the students to name the concept?	Thoroughly	Partially	Missing	Not Needed
11. Did the teacher ask the students to state the essential attributes of the concept?	Thoroughly	Partially	Missing	Not Needed

PHASE 2: Testing Attainment of the Concept

12. After the concept was agreed upon, did the teacher present additional exemplars and ask whether they contained the concept?	Thoroughly	Partially	Missing	Not Needed
13. Did the teacher ask the students to justify their answers?	Thoroughly	Partially	Missing	Not Needed
14. Were the students able to supply their own exemplars to fit the concept?	Thoroughly	Partially	Missing	Not Needed
15. Did the teacher ask the students to justify their exemplars by identifying the essential attributes?	Thoroughly	Partially	Missing	Not Needed

PHASE 3: Analysis of Thinking Strategies

16. Did the teacher ask the students to describe the thinking processes they used in attaining the concept?	Thoroughly	Partially	Missing	Not Needed
17. Did the teacher ask the students to reflect on the roles of attributes and concepts in their thinking strategies?	Thoroughly	Partially	Missing	Not Needed
18. Did the teacher ask the students to evaluate the effectiveness of their strategies?	Thoroughly	Partially	Missing	Not Needed

TEACHING ANALYSIS GUIDE FOR THE SYNECTICS MODEL

Phase One: Description

1. Did the teacher elicit ideas from students about the topic?	Thoroughly	Partially	Missing	Not Needed

Phase Two: Direct Analogy

2. Did the teacher define a direct analogy?	Thoroughly	Partially	Missing	Not Needed
3. Did the teacher specify the type of analogy, such as nonliving or machine?	Thoroughly	Partially	Missing	Not Needed
4. Did the teacher elicit analogies?	Thoroughly	Partially	Missing	Not Needed
5. Did the category of analogy appropriately contrast the topic? (For example, if the topic was a living thing, such as a shy child, was the category of analogies nonliving things, such as a machine?)	Thoroughly	Partially	Missing	Not Needed
6. Did the teacher elicit several analogies?	Thoroughly	Partially	Missing	Not Needed
7. If necessary, did the teacher ask students to clarify their suggested analogies?	Thoroughly	Partially	Missing	Not Needed
8. Did the students select one analogy to work with?	Thoroughly	Partially	Missing	Not Needed
9. Was the analogy familiar to all the students?	Thoroughly	Partially	Missing	Not Needed
10. Did the teacher elicit descriptions of the analogy?	Thoroughly	Partially	Missing	Not Needed
11. Did the teacher record these descriptions?	Thoroughly	Partially	Missing	Not Needed

Phase Three: Personal Analogy

12. Did the teacher explain a personal analogy?	Thoroughly	Partially	Missing	Not Needed
13. Did the teacher ask students to become the "object"?	Thoroughly	Partially	Missing	Not Needed
14. Was the teacher able to get the students to state from a personal frame of reference:				
A. how they felt as the "object"?	Thoroughly	Partially	Missing	Not Needed

B. how they looked as the "object"? Thoroughly Partially Missing Not Needed

C. how they acted (kinesthetic involvement)? Thoroughly Partially Missing Not Needed

15. Did the teacher record the personal analogy description? Thoroughly Partially Missing Not Needed

Phase Four: Compressed Conflict

16. Did the teacher define compressed conflict? Thoroughly Partially Missing Not Needed

17. Did the teacher summarize the direct and personal analogies or ask the students to summarize them? Thoroughly Partially Missing Not Needed

18. Did the teacher elicit several compressed conflicts based on the materials from the direct and personal analogies? Thoroughly Partially Missing Not Needed

19. Were the students involved in the selection of one compressed conflict that was familiar to all of them? Thoroughly Partially Missing Not Needed

Phase Five: New Direct Analogy

20. Did the teacher elicit several ideas containing the compressed conflict? Thoroughly Partially Missing Not Needed

21. Were the students involved in the selection of one idea that was familiar to everyone? Thoroughly Partially Missing Not Needed

22. Did the teacher elicit discussion of the direct analogy in terms of the compressed conflict? Thoroughly Partially Missing Not Needed

Phase Six: Reexamination of the Original Task

23. Did the teacher have the students describe the original task (idea) in terms of the last direct analogy? Thoroughly Partially Missing Not Needed

24. Did the students' descriptions indicate new dimensions or perceptions of the original task? Thoroughly Partially Missing Not Needed

TEACHING ANALYSIS GUIDE FOR TABA'S INDUCTIVE THINKING MODEL

I Concept Formation				
1. Did the teacher provide a focus for the lesson?	Thoroughly	Partially	Missing	Not Needed
2. Did the teacher explain procedures for generating data?	Thoroughly	Partially	Missing	Not Needed
3. Were sufficient data generated for grouping/categorizing?	Thoroughly	Partially	Missing	Not Needed
4. Were students instructed to group the data by "what belongs together"?	Thoroughly	Partially	Missing	Not Needed
5. Did the teacher ask the students to name or label the groups?	Thoroughly	Partially	Missing	Not Needed
II Interpretation of Data				
1. Did the teacher ask the students to explain the characteristics of each group or category?	Thoroughly	Partially	Missing	Not Needed
2. Did the teacher ask the students to explain their data, relating points to each other and attempting to determine cause-effect relationships ("Why" questions)?	Thoroughly	Partially	Missing	Not Needed
3. Did the teacher ask the students to go beyond the data and make inferences and conclusions regarding their data?	Thoroughly	Partially	Missing	Not Needed
III. Application of Principles				
1. Did the teacher ask the students to hypothesize, predict consequences from their data ("what would happen if" or "if. . . , then. . . .)?	Thoroughly	Partially	Missing	Not Needed
2. Did the teacher ask the students to explain and support their predictions and hypotheses (Why do you think this would happen)?	Thoroughly	Partially	Missing	Not Needed
3. Did the teacher ask the students to verify their predictions/hypotheses using logic or factual knowledge?	Thoroughly	Partially	Missing	Not Needed

TEACHING ANALYSIS GUIDE FOR THE TRAINING MODEL

Phase One: Clarification				
1. Did the teacher clearly state the objectives for the students (what they are to learn and why)?	Thoroughly	Partially	Missing	Not Needed
Phase Two: Theory or Rationale				
2. Did the teacher explain why the skills/behaviors operate as they do?	Thoroughly	Partially	Missing	Not Needed
3. Did the teacher include readings, diagrams, etc. to augment the theory or rationale underlying the new skills?	Thoroughly	Partially	Missing	Not Needed
Phase Three: Demonstration				
4. Was the skill/behavior demonstrated, either by the teacher or through media?	Thoroughly	Partially	Missing	Not Needed
5. Was the new skill/behavior analyzed into components and sequenced appropriately?	Thoroughly	Partially	Missing	Not Needed
Phase Four: Practice/Feedback				
6. Did students have an opportunity to practice new skills/behaviors in simulated conditions?	Thoroughly	Partially	Missing	Not Needed
7. Was feedback on student performance provided during or immediately following performance?	Thoroughly	Partially	Missing	Not Needed
8. Was feedback specific to the skills/behaviors being attempted by students?	Thoroughly	Partially	Missing	Not Needed
Phase Five: Transfer				
9. Was practice provided in gradually more realistic conditions?	Thoroughly	Partially	Missing	Not Needed
10. Was feedback continued during the transfer period?	Thoroughly	Partially	Missing	Not Needed